

Home Computing WEEKLY

NEW

An Argus Specialist Publication

March 15-21, 1983

No. 2

35p

HEALTH RISK OF MICRO SPACE GAMES

Space invader games put as much stress on the heart as driving through heavy traffic. And some players could be risking long-term heart trouble.

Volunteers, wired up with electrodes, have spent hours playing the game on a laboratory micro at Birmingham University.

Researchers have identified up to 25 young men with very high heart rate increases while playing. Now the families of all 100 volunteers are being checked to see if there is a history of cardiovascular problems.

The research is being led by psychologist Dr. Douglas Carroll with assistant Jane Sims.

They want to find out why stress affects some people and not others and whether heredity plays any part in cardiovascular complaints.

So far 100 students, aged 18-25, have played the game on a Commodore PET micro. Outsiders are now going through the same tests.

Dr Carroll said: "We are using one of the first generation of space invaders — it's not one of the more complex games that have come along since. We are finding in some individuals that they showed very high heart rate changes.

"Between a quarter and fifth had heart rate changes which were greater than we would expect.

"The game provides a competitive situation in which the player, particularly the inexperienced, may find difficulty in coping. If someone who is susceptible would play a lot then it could have an effect on health."

He emphasised that his volunteers were healthy young men on whom the tests would have no effect.

He said: "We are simply using the game as a rather good way of inducing heart rate changes."

People with very high changes in heart rate stood a five times

Continued on page 3

Radio software gets go-ahead

Programs are going out by radio, now the Home Office has granted permission.

Presenters Tim Lyons and Edwin Tozer, both engineers at Bristol-based Radio West, had to get special consent to broadcast data during their Monday night Datarama programme.

Edwin, 26, who has a BBC model B micro at home, said: "We had to get permission from the IBA and the Home Office because the IBA were not sure we were allowed to do it under the broadcasting act.

"During the programme we are broadcasting data for the BBC micro and the ZX81 at the moment. I think it's going to take off in a big way — there's a lot of interest.

"We reckon there are about 15,000 computer owners in our broadcast area and we hope to put out data for the Commodore 64, the Dragon, Apple and the Spectrum.

"We will probably let the show regularise itself and then offer it to the network, about 40 stations."

Edwin and Tim, 31, suggest two methods of receiving the
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INSIDE

Reviews of software for VIC-20

Programs to type in for:

Spectrum, VIC-20, BBC, Commodore 64, ZX81,

Atom Profile of software house Articles on

Atari, bulletin boards

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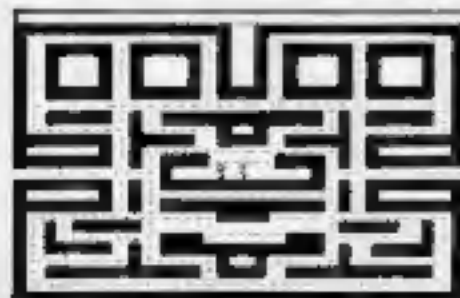
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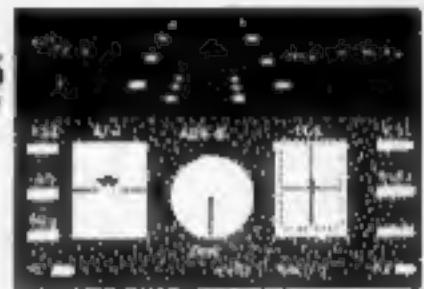


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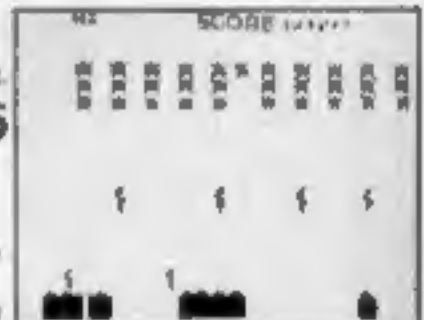
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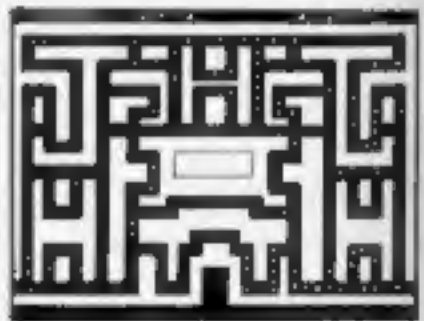
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IN BRIEF

Commercial TV stations and the BBC have been given consent to broadcast programs for direct downloading into micros.

The Telecommunications Bill has been amended by the Government in a Commons committee.

Junior industry minister John Butcher said telesoftware was permitted now, but only if it was capable of TV display too.

Direct downloading meant the signals went straight into computers without a visual display.



Oric-1 software is being produced by a new company, Kenema Associates.

Included in the range is a £15 Multipurpose/Personnel Records File which, says Kenema, allows mass storage and file handling of confidential information on personnel or products.

There is also an Oric-1 Keyboard Trainer, games, books and accessories, including American Oric-1 T-shirts.

Kenema Associates, 1 Mariborough Drive, Worle, Avon, BS22 0DQ



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It dries to a scratch-resistant matt film which is said to cut reflected glare by up to 75 per cent while retaining 95 per cent of the brightness with only a negligible effect of clarity.

Regisbrook has also brought out Arit-Matter, an aerosol spray cleaner for similar surfaces. The two products can be bought together at £14.50.

Regisbrook, Studio House, 215 Kings Road, Reading, Berks RG1 4LS.

Home Computing WEEKLY

News..... 5, 6, 8, 10, 13, 15

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Spectrum program 43

An eye-catching fruit machine game. Just type it in and place your bets

Editor: Ron Harris	Advertisement Manager: Coleen Pimm
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Home Computing Weekly is published on Tuesdays. Distribution by Argus Press Sales and Distribution Ltd, 12-14 Paul Street, London EC2A 4JS. Printed by Alabaster Paustone & Sons Ltd, of London and Maidstone, Kent. Design and origination by MM Design and Print, 145 Charing Cross Rd, London WC2H 0EE	

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Continued from Front Cover

greater chance, on average, of later suffering from hearts problems.

Dr Carroll said: "We are using space invaders to imitate what may be happening in other stressful situations."

Volunteers wore electrodes to measure their heart rates and masks to measure their respiration. Away from the laboratory the electrodes were connected to tiny tape recorders to record heart rates in their day-to-day lives.

Normal heart beat is 70 per minute. While playing space invaders it went up to 90-100.

Describing the body's reaction to the game, Mrs Sims said: "It's like driving a car on busy roads or doing some hard study. This has to be put against any other risk factor like diet or smoking.

"The fact of the matter is that it was not necessarily those who were addicted to the game who had a high heart rate.

"None of them seemed to mind doing it. The people we were testing have been involved in other projects, so this is nothing unusual for them.

"They all seemed to have been happy playing the game. I don't play very much myself — I don't find the time."

The study, financed by the Medical Research Council, is a pilot project due to end in November.

Artic Computing boss Richard Turner smiled when he heard of the study and said: "Does this mean we'll have to put a Government health warning on our cassettes."

He said: "The people who play our games are usually teenagers. Your average overweight 50-year-old doesn't play space invader-type games.

"It might be a strain on the heart, but they can take it.

And Mark Butler, partner in Liverpool software house Imagine, said: "We design an arcade game so that people's heart rates do increase. My heart beats faster when I'm playing football — and that's good for you."

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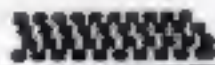
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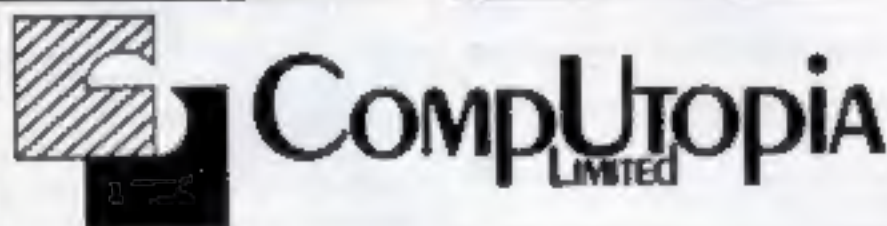
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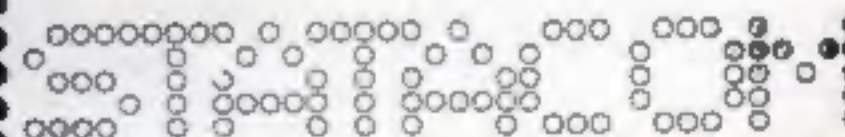


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Continued from Front Cover

data. The most reliable is to tape it onto a cassette recorder/radio. This means the volume can be adjusted when the program is loaded into the computer. A second method is to connect the radio directly to the computer.

In this way listeners can see the program on screen as it is being discussed in the studio.

Longer programs, starting with the Newbrain and the Epson HX-20, will be broadcast after the station's 1am closedown to 5.45am.

Radio stations are obliged to broadcast a steady tone during non-programme hours. Every 15 minutes a tape recorder in Radio West's studio automatically sends out an identification message. The data is simply being added to this.

Edwin, who broadcasts as Zorte, said: "Micro enthusiasts are well known for burning the midnight oil."

Tim and Edwin believe it is the first time in Britain that radio has been regularly used to transmit programs.

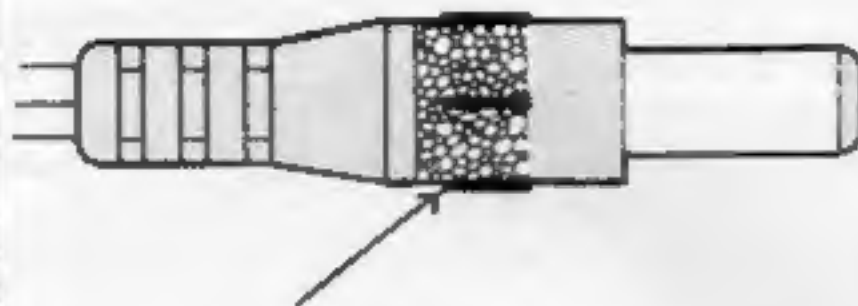
Why does Edwin use the name Zorte? He explained: "When I first arrived here I was in motorcycle gear and they thought I looked like an alien, so they called me Zorte from the planet Oje — an anagram of Joe Tozer. Some people call me Joe."

Radio West broadcasts on 238m (1260KHz) medium wave and 96.3 VHF. According to Edwin, its medium wave signal, transmitted from Mangousfield, north of Bristol, can be received in a 40-mile radius, and the FM signal, which comes from Daudney Hill, south of Bristol, covers a 25-mile radius.

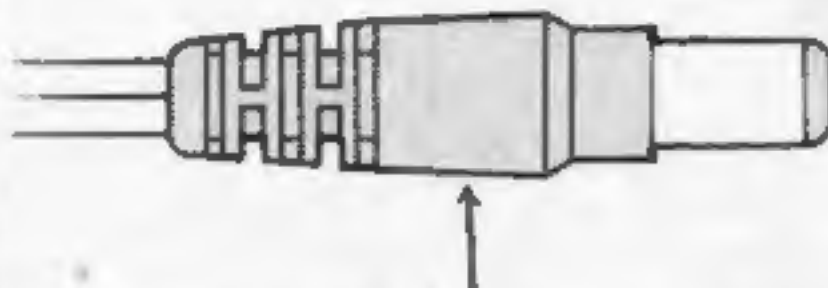
Strangely, they have found data reception is more reliable on medium wave. Datarama goes out on Monday nights at 7.30-8pm.

BBC Television's series Making the Most of the Micro also transmitted a program last night. It will be broadcast again when the programme is repeated on Sunday at 12.35pm.

Radio West, P.O. Box 963, Watershed, Canon's Road, Bristol BS99 7SN. Send a stamped addressed envelope.



Type A jack plug — perfectly safe grip



Type B jack plug — potentially dangerous surface with no grip

Big response to call-back

Sinclair's appeal for faulty Spectrum power supplies to be returned has brought a massive response.

"Our production director is confident he will get them all back," said a spokesman for Sinclair Research. "Keeping our fingers crossed, there doesn't seem to have been any accidents."

The appeal went out after a batch of 28,000 power supplies sold with Spectrums and made by sub-contractors were found to have faulty cables which, under some circumstances, could be dangerous.

Half were returned from stocks held by retailers and Sinclair and a personal letter from Clive Sinclair went to mail order customers.

A spokesman said: "They seem to be coming back fast — people are responding very quickly. They are getting their replacements in seven to 10 days."

"The only problem we are having is that the special address we have given is for returned power supplies only, not for other mail."

The problem is only with Spectrums bought between January 1 and up to three weeks ago and only if the lead between the power supply and the computer is black with a white stripe.

And it only affects power supplies with a smooth-surfaced

— not textured — finger-grip on the jack plug.

Sinclair says anyone in any doubt about the type of jack plug should return their power supply.

The address: Sinclair Research Ltd, Unit F, Broad Lane, Cottenham, Cambridgeshire, CB4 4SW.

Software by post

London software stockists The Video Palace has started a mail order operation with the first of its quarterly catalogues.

Managing director Peter Stone said he was responding to postal enquiries and was aiming to give a service to people living

Magazines up and down

Latest official sales figures for monthly computer magazines show that two have lost readers and two have chalked up gains.

Computing Today, at 53,138, is up by 3,088 and Personal Computer World (85,105) has gained 18,563 sales.

The two which have lost circulation are Practical Computing (49,052), which is down by 11,720, and Your Computer (72,875), 11,375 less.

The most recent figures, checked by the Audit Bureau of Circulations, are for the six months to December and are compared with the same six months in 1981.

Your Computer's sales figure is compared with its first ABC rating, for the six months to June 1982. Its rival, Personal Computing Today, has a first ABC figure of 62,064.

Computing Today and Personal Computing Today are owned by the publishers of Home Computing Weekly, Argus Specialist Publications.

out of town who had difficulty buying the latest goods.

It features software, books and add-ons for the Atari 400 and 800, TI-99/4A, BBC micro, Spectrum, VIC-20 and Commodore 64, along with advice and recommendations and a 10 per cent discount voucher.

The Video Palace, 62-64 Kensington High Street, London, W8

Top Ten programs for the Spectrum

1	The Hobbit	Sinclair
2	Flight Simulation	Sinclair
3	VU-3D	Sinclair
4	Time Gate	Quicksilver
5	Penetrator	Melbourne House
6	Hungry Horace	Sinclair
7	Chess	Sinclair
8	Avenger	Abacus
9	3-D Tank	D K Tronics
10	Escape	New Generation

Compiled by W. H. Smith

Four years ago

Among the first computers from the Far East was the EG-2001 Video Genie, produced for an American customer, which came with 4K of ROM and a cartridge slot... a letter editor, written by ICL for the Nascom-1, came on two EPROMs and cost £70, plus eight per cent VAT... Commodore's PET, with screen and built-in cassette player, cost £643.52 and included 8K of RAM.

Atari chief to go it alone

In a surprise move, Atari chief Graham Daubney has quit the company to go into software sales.

He has bought into Birmingham-based Centresoft, run for nine months by Jeff Brown, and one of his first jobs is to open a London office.

Mr Daubney, married with a year-old daughter, said: "I'm now out in the big wide world. It was something I wanted to do in about two years, but this was an opportunity.

"I've known Jeff and his wife Anne for quite a while and we got together and worked out a deal. We got down to the nitty-gritty when I got back from the States in late January.

"Myself and Atari have parted on good terms. I was very sad to leave, but it was an oppor-

tunity I couldn't miss. My wife Jan is all in favour, too."

He said Centresoft at present had a catalogue of 100 titles on cassette, disco, ROMs and cartridges. The company — which specialises in Atari software — imports from America and distributes to the UK and Europe.

Mr Daubney, 28, said Centresoft's aim was to act as a filter, weeding out "the rubbish" to supply retailers only with good quality products. He planned to expand Centresoft's range.

Mr Daubney, who was one of four to set up Atari's UK computer operation in April last year, resigned as product manager of the home computer division. He said he had also been asked to be European editor of an Atari magazine, due in the UK in three months.

Centresoft, 26 Great Cornbow, Halesowen, West Midlands

Dads fuel micro boom

One home in every 20 has a microcomputer — and a quarter of them were sold in December, says a new survey.

Main buyers are father with school-age children. And once the micro is at home the main users, at 80 per cent, are father and son. Wife and daughter add up to just 11 per cent of the users.

The under-18s make up 45 per cent of users and the 20-50 age group accounts for another 49 per cent. The over-50s and those aged 18-20 seem to have little interest.

The survey, by Gowling Marketing Services for the trade fortnightly *Microscope*, was carried out in January and late February and included 2,000 UK households.

It also showed that one-third of home computers were bought in chain stores and 19 per cent by mail order.

Arcade games were the best-

selling with games and education totalling two-thirds of software sales. Domestic uses added up to only six per cent.

model	%
ZX81	43.3
Spectrum	14.4
VIC20	12.4
BBC Micro	5.2
Dragon	5.2
Sharp MZ80K	3.1

Market shares of leading machines

outlet	%
Mail order	19
Wh Smiths	18
Specialist shop	16
Spectrum	5
Dixons	5
Other High St shop	4
Boots	3
Currys MicroC	2
Lasky's	1
Other	24
Don't know	5

Where computers were bought

use	%
Arcade games	43
Educational	26
Business	13
Graphics	11
Home economics	6
Assembler	3
Other/don't know	34

What the machines are used for

Let us know

If you are in the microcomputer business, please let us have your news and products to review. Contact Paul Liptrot, Home Computing Weekly, 145 Charing Cross Road, London WC2H 0EE. Phone: 01-437 1002.

Commodore attacks on home front

Commodore says it is now No. 1 in sales of home and personal computers — quite an announcement from a company, which, in my opinion, was a non-starter here a year ago. And Commodore predicts it will also be No. 1 in business computers too by this time next year.

Its new Commodore 64, reported to be selling at the rate of 30,000 a month, has been re-classified by the company from a personal to a home computer, which must mean, by its definition, a drop in price to below 500 dollars.

There has, in fact, been a flock of announcements from Commodore.

Its new portable, weighing just 12 lbs, has a built-in 5in screen, half-size dual 5¼in floppy discs, 64K of RAM, a combination of Z80 and 6510 processor chips and costs 1,000 dollars for the monochrome version. Then there's a speech synthesizer for the 64. It uses the SAY statement in a similar way to PRINT — you enclose whatever is to be "spoken" in quotation marks.

Commodore also announced its Model 128 which, not surprisingly, has 128K of RAM and a price of 795 dollars. There's the hand-held HHC-4, too, which can be hooked up to a regular TV screen, although it comes with a built-in liquid crystal display, and a video output to drive a monitor.

In the games department, Commodore talked about its Digi-Drum peripheral that can be connected to either the 64 or the VIC-20. This neat toy is a three-pad miniature drum set that allows the user to simulate the sounds of a snare drum, bass drum and high hat when connected to a stereo system. It's expected to cost about the same as a game cartridge.



If you have a Sinclair 1000 (ZX81 to you) and are wondering what else you can do with it, wonder no longer. The Watchmaker's Guidebook to the Timex/Sinclair Computers is available by mail order from TSG Enterprises.

It lists about 120 software suppliers and 50 hardware manufacturers and other useful information such as user groups, books and articles which may be helpful.

A chapter offers help on writing BASIC programs. Written by Peter Beck, the plan is to update the book quarterly.

Send 3.95 dollars (an international money order is best) plus shipping and handling charge to TSG Enterprises, Guidebook, 54 Richwood Place, Denville, New Jersey 07834. Shipping and handling is a dollar in the U.S. Add more for the UK, or ask TSG.



It's important to have a sense of humour in this business. The first rock 'n' roll video game has been brought out by Data Age, of Campbell, California.

Available only for the Atari 2600 video game player, it's called *Journey Escape* and stars the rock band Journey. It's basically your fundamental day in the life of a rock star game. In order to win you have to get your group past hordes of groupies and assorted other "drawbacks" of life in the R & R fast lane.

Only in California...

Bud Izen
Fairfield, California

A colourful way to raise money

An eye-catching fruit machine game for the Spectrum, written by Clyde Bish

My fruit machine program has proved itself a good money-raiser for charity at fêtes.

Written for the Spectrum, it makes eye-catching use of the colour and graphics facilities.

Line 530 is particularly interesting as it uses the SCREENS function in a way not mentioned in the handbook to simulate the DFCC variable of the ZX81.



The program as listed gives a profit of about 1p per roll.

This can be increased or decreased by altering either the

payout for a win in lines 620, 655 and 740 or by changing the odds of RND in line 480.

```

100 INK 4: PRINT AT 7,12,"██████████"
110 PRINT AT 8,12,"██████████"
115 PRINT AT 8,14; INK 0;"3"; AT
8,16;"7"; AT 8,18;"4"
120 PRINT AT 9,12,"██████████"
130 PRINT AT 11,13; INK 2;"5p A
GO"
140 PRINT AT 13,2;"TWO PAYS 10p
K...THREE PAYS 15p"; AT 15,13; IN
FLASH 1;"JACKPOT"; AT 16,10;
FLASH 0; INK 2;"777 PAYS 50p"
150 PRINT AT 19,9; INK 3;"PRESS
R TO ROLL"
200 FOR i=1 TO 8
210 INK i
220 PRINT AT 0,3;" ██████████
██████████ ██████████
██████████ ██████████
██████████ ██████████
██████████ ██████████
██████████ ██████████
██████████ ██████████
██████████ ██████████"
240 PRINT AT 1,3;" ██████████
██████████ ██████████
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██████████ ██████████
██████████ ██████████
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██████████ ██████████
██████████ ██████████"
260 PRINT AT 2,3;" ██████████
██████████ ██████████
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██████████ ██████████
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██████████ ██████████"
280 PRINT AT 3,3;" ██████████
██████████ ██████████
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██████████ ██████████
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300 PRINT AT 4,3;" ██████████
██████████ ██████████
██████████ ██████████
██████████ ██████████
██████████ ██████████
██████████ ██████████
██████████ ██████████
██████████ ██████████"
310 PAUSE 10
320 IF INKEY$("<>") THEN GO TO 40
330 NEXT i
340 GO TO 200
400 INK 0: PRINT AT 19,8;"
470 FOR j=1 TO 30
475 FOR f=1 TO 3
480 PRINT AT 8,12+2+f;INT (RND*
7)+1
485 NEXT f
490 NEXT j
530 LET a$=SCREENS (8,14): LET
b$=SCREENS (8,16): LET c$=SCREEN
$ (8,18)
531 IF a$("<>")b$ AND b$("<>")c$ AND a$
("<>")c$ THEN GO TO 6000
532 LET d=17

```

```

535 GO SUB 5400
565 FOR i=1 TO 3
570 PRINT TAB 3; FLASH 1; PAPER
4; INK 2;"WIN
WIN"
575 PAUSE 2
580 NEXT i
585 LET d=21
590 GO SUB 5400
610 IF a$=b$ AND a$=c$ THEN GO
TO 650
620 PRINT AT 19,11;"PAY OUT 10p"
630 PAUSE 100
640 GO TO 6015
650 IF a$="7" THEN GO TO 700
655 PRINT AT 19,11;"PAY OUT 15p"
660 GO TO 630
700 FOR i=1 TO 70
710 PRINT AT 19,13;"JACKPOT"
720 PRINT AT 19,13;"
730 NEXT i
740 PRINT AT 19,11;"PAY OUT 50p"
750 GO TO 630
5400 FOR i=3 TO 25 STEP 4
5500 PRINT AT d,i; FLASH 1; PAPER
4; INK 2;"WIN"
5550 PAUSE 2
5600 NEXT i
5620 PAUSE 2
5630 PRINT AT d,27; FLASH 1; PAPER
4; INK 2;"WIN"
5850 RETURN
6000 PRINT AT 19,5;"HARD LUCK!
TRY AGAIN?"
6010 PAUSE 100
6015 FOR i=17 TO 21
6020 PRINT AT i,3;"
6022 NEXT i
6025 PRINT AT 19,9; INK 3;"PRESS
R TO ROLL"
6030 GO TO 200

```


Bug-Byte stops mail-order sales

Liverpool-based Bug-Byte, with claimed sales of 30,000 software cassettes a month, has halted its mail order operation — and has six new releases out soon.

And Tony Baden revealed that he and partner Tony Milner, 24, are linking up with two others to open a tape duplicating plant.

Mr Baden, 23, said: "It will be completely independent."

Explaining the ending of mail order, he said that over the last six months demand for orders by post had fell by 50 percent, yet dealer sales were up by 300 percent.

The limiting factor was the rate at which cassettes could be copied — one duplicating company wanted eight weeks but Bug-Byte needed a two-week turn-round. This led to the decision to open their own plant.

Bug-Byte began three years ago with five 1K programs for the ZX80 priced at £2 and a £3 classified advert in a magazine.

Now, said Mr Baden, the partnership sold 30,000 cassettes a month from a catalogue of about 40 titles, had 220 dealers

taking its products — with more coming in — and is moving to new premises in central Liverpool in May. Turnover was £2m rising to £1m-plus in the next financial year.

The new releases, priced at £7.50 to £9.50, are Space Invaders, Galaxy Wars, City Defence and a music synthesizer, all for the BBC micro, and an adventure game, The Castle, for the Oric-I and the Spectrum. The first four are due out in a fortnight with the adventure game due two weeks later.

Tony Baden said Bug-Byte had 10 regular freelance programmers who each earned 10 percent of the wholesale price, or a lump sum of around £2,000-£3,000.

He said: "The difficulty is finding the good programmers. We don't want the average — we are continually improving our standards. Good programming is due to self-motivation. I don't think it's down to education."

"We get a lot of good programs sent in for the BBC machine but not for the Spectrum. It seems people who are good at programming buy the BBC micro."

Bug-Byte Software, Freeport, Liverpool L3 3AB

Smiths open micro stores

Computer shops-within-stores are being opened by W. H. Smith. And it has ordered Oric-I's and Commodore 64s to add to its Sinclair micros.

Merchandise controller Stewart Binnie said three stores — one large, one medium and one small — had been chosen for pilot computer shops before more were opened.

At present, W. H. Smith sells 5,000 Spectrums a week, Commodore 64s and 48K Oric-I's, plus BBC micro software, are planned to go on sale next month.

Mr Binnie said: "We don't take machines unless the software is available. We are now in the happy situation where the major software houses start writing programs when they know we are going to stock the machine."

Altogether £5m-£10m was being spent on the computer side of the business this year, most of it on computers.

The shops-within-stores would be a distinctive area,

something like the wool shops in some W. H. Smith branches, and staffed by people trained at the company's Didcot college.

Mr Binnie is one of four W. H. Smith merchandise controllers, each of them responsible for a segment of the stores' product range.

He said: "We have had problems over the stock of some of the leading software titles."

"The problem is the duplicating capacity in the UK. Our orders were using most of it and still leaving us out of stock."

"Our sales are in the hundreds of thousands."

He said: "It's the fastest-growing area of our business, a phenomenon all of its own. How will it endure? It will continue to grow for a long time."

"There will be two years of the present growth, the figures are quite extraordinary. There are projections of 1½m computer sales."

He did not believe that rate would be sustained after two years.

W. H. Smith, 10 New Fetter Lane, London EC4

Get out of the cupboard, micro snobs

Why do the computer snobs knock poor old Uncle Clive? Having just announced that his company has successfully sold its one millionth computer, surely they must accept him by now?

After much experience along the long and winding road of hobby electronics, in which Clive Sinclair had brief forays into hi-fi, writing books, the infamous "black watch" and the low-cost calculator, he emerged triumphant on the computer scene in 1980 with the ZX80. With sceptical questions like "how can anyone produce a personal computer for under £100?", Clive Sinclair was relegated to the position of an inexperienced entrepreneur in a very grown-up and sophisticated market dominated by PETs, Apples and Tandys.

No-one would disagree that the ZX80 was very much to test the lower end of the computer market — but that argument could hardly be levelled at the ZX81. Realising the successful trail blazed with the ZX80, Sinclair Research was quick to introduce the '81. The price was an obvious winner, but it had other finer qualities, too.

Of course it had its bad points — the cassette LOAD and SAVE left a lot to be desired, the keyboard was difficult to wrap your fingers round and the reduced component count made the machine unnecessarily complex. But it sold. And, more importantly, it sold to the generations, old and young, that had yet to be "threatened" by computing. It made the inaccessible accessible to anyone who had under £100.

I wouldn't say Clive Sinclair has been original. In some ways, he has followed the classic marketing approach of Apple, building a machine with standard specifications and leaving it to others to fill in the rest, like joysticks, software, and soon, unlike Commodore, Tandy and Sharp who are somewhat exclusive about what gets added onto their machines. Sinclair Research has carved itself an impressive niche.

With the ZX Spectrum, the first whisperings of praise were heard in the more "serious" computer magazines. Hard bitten editors could be seen climbing out of the computer snobbery closet with back-handed compliments such as "mum, it's a moderately fast machine" and "it's quite easy to produce user defined graphics on it but..." You could tell — they quite liked it, and that was going to take some getting used to.

So, could it be that Clive has ousted all the computer snobs from their closets? Well, maybe not with the Spectrum, but I suppose that the "ZX83" might just cut the ice (and no, I don't know anything more than its development name). Take a look at all the fresh faces in the "under £100" computer market, and you'll see "Clive Sinclair" stamped on them — which, when you consider what Clive has done for the personal micro, might not be such a bad thing.

And what do I think of the Sinclair range of computers? Well, I climbed out of the computer snobbery cupboard a long time ago. Anyone who can induce computer programming hysteria in a nation of kids (from seven years old to 70) must be either a very lucky man or a genius.

If I ever find out which, you'll be the first to know.

*Roger Munford
Deputy Editor, ZX Computing*

• What makes you angry — delighted — about the micro market, hardware or software? We welcome contributions for this weekly column. Send them to: Opinion, Home Computing Weekly, 145 Charing Cross Road, London WC2H 0EF. Please include your occupation and your interest in computing.

Push your Sinclair to the limit

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SPEC FROG 5/SHOWDOWN (16/48K)

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Gobblerman also available for ZX81 at £3.95

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ZX BUG
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Improve your machine code programs with this new 48K Spectrum Assembler

Just released by Artic, this new professional quality assembler is also available for 16K ZX81 and features —

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A new improved version, with a faster response time, seven levels of play, analysis option and in addition a recommended move option. **£9.85**

ZX 1K CHESS
An incredible game *As featured on TV* in 1K for only **£2.95**

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This incredible program talks you through your game. It tells you its moves, recommends a move, and contains a range of fabulous comments. The game is based on the highly successful ZX Chess II and is offered at the Christmas offer price of **£9.85**.

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Firefly cycles to success

Three sixth-formers wrote Spectrum programs in their bedrooms — and ended up with £170 profit. And now they are signing a marketing deal expected to earn them much more.

Firefly Software is a partnership of Ian Macey, 17, and 16-year-olds Mark Harman and Peter Aked, who live within cycling distance of each other in Berkshire.

The idea came to them after they had seen commercially written programs. Ian, whose father works for the Meteorological Office in Bracknell, said: "We were sure we could do better."

Ian raised the money he needed with part-time work creosoting a fence and Peter was a spare-time labourer. They began work, learning machine code from books, last summer. Mark, who bought his 16K Spectrum from a school friend, joined them at Christmas.

Transport for this bedroom industry was bicycles — they cycled to each others' homes with Spectrums hanging from the handlebars.

All three are each studying for A-levels in the sixth form of a Wokingham comprehensive school. Ian said: "Our parents thought we were doing too much, but we think we can get by. They were a bit stunned when we earned so much money. We thought we might get enough to buy a printer."

Peter, whose father is an electronics engineer, said: "On the Friday before the ZX Microfair I was up until 1am taping my program onto cassettes I bought from W.H. Smith for 50p each."

The three hope they will make enough money to allow them to take a year off between school and further education to establish Firefly as a professional concern.

The Microfair was the first time their programs had been on sale — two games, *Androids* and *Sword Fight* at £4.95, and a collection of educational programs on one tape, priced at £3. All run on the 16K Spectrum.

They took £227.90 and made £170 profit after deducting the hire of their show table, £40.20, and other expenses.

And they reckon they could have sold even more — if they had more to sell and if they had been able to take a colour TV to the show. The only television they had on their table was black and white, so they put up a large sign saying the programs really were in colour.

In all they had 16 offers from shops, which wanted to buy batches of 20 to 30, and from distributors. They included a Dane, a South African, a Belgian — and a Spaniard who tried to negotiate through an interpreter.

Mark said: "I'm coming to terms with the fact that we may be going somewhere, but I'm trying not to build up our hopes."

"Our teachers are starting to be more sympathetic about late

From left: Peter, Ian and Mark

homework now. Our physics teachers have got Spectrums so we gave them copies of the programs."

Firefly Software, Sunnybank, Heath Ride, Wokingham, Berks RG11 3QN

Youngsters' programs

A new company, Schoolsoft, has been formed with the aim of producing software for infant and junior schoolchildren to run on the BBC model B micro.

The first eight programs, costing £5-£10, cover arithmetic, British Isles geography, handwriting and colour sequences.

Schoolsoft, 19 Shadwell Grove, Radcliffe-on-Trent, Nottingham.

Words for the Epson

Kuma Computers has brought out a word processor designed for the tiny printer built into Epson's HX-20 small computer.

It is called Desk-Master 2 and comes on the micro-cassettes used by the HX-20 and priced at £32.74. Kuma says it is easy to use and can also print larger documents on a full-size external printer.

Kuma Computers, 11 York Road, Maidenhead, Berks SL6 1SQ.

Shelve your micro



Home computer stand in the lower shelf slides away

Keep your micro tidy, say the people at Zygon Products who have produced this specially designed stand for use at home.

Costing £65.50, it is made from square steel tubing finished in black with shelves in silver-grey or teak laminate and is mounted on castors.

The lower shelf, measuring

26 inches by 19 inches, slides away when not in use. The upper shelf measures 28 inches by 19 inches.

The company says that the stand, provided with cable ties, has been designed to suit most home computers. Soon the basic stand will be extendable to take additional units.

Zygon Products, 9 Sheredes Drive, Broxbourne, Herts EN11 8LH.

missile panic



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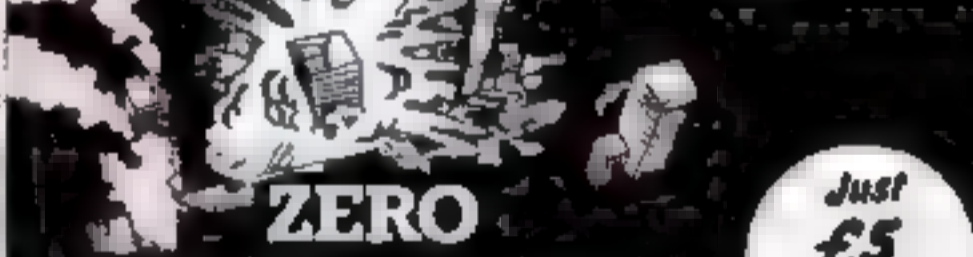
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Must be won:



15 Spectrums plus £2,500 in software

It's week No.2 in our great £6,200 competition. Will you be one of our 115 winners?

We are giving away 15 computers and £2,500-worth of software in Home Computing Weekly's free-easy-to-enter competition. It is spread out over our first three issues, so you'll need the coupon from last week and next week's issues too.

We have got together with leading software house Quicksilva and Sinclair Research, makers of the best-selling micros.

These are the prizes:

★ Fifteen 48K ZX Spectrums, each with a printer and three programs from Sinclair's range. Each of these prize packages is worth £250.

★ Software worth £2,500 from Quicksilva. Make your choice from a range of 39 programs for the Spectrum, VIC 20, ZX81, BBC, Dragon and Atari. This total is divided into 100 vouchers of £25 each.

All you have to do is to answer the questions in the coupon. All of the questions are based on this week's issue of Home Computing Weekly. Keep the coupon, with last week's, in a safe place.

There will be a final set of questions next week along with details of how to send in all three coupons.

Do not send anything to us now. Entries will only be accepted if they contain all three coupons (not copies).

This competition is not open to the staff of Home Computing Weekly, Argus Specialist Publications, Aubaster Passmore, Sinclair Research and Quicksilva. The editor's decision is final and no correspondence will be entered into.

Entry coupon No.2 This must only be sent with coupons from issues 1 and 3.

- 1 How many stars for Mastermind?
- 2 What did Alan Laird write?
- 3 Program 14's name
- 4 How much profit on the fruit machine?
- 5 What does Peter Tootill run?
- 6 Memory location 755 is called?
- 7 Acorn's waste. What is its highest score?

There will be space for your name and address on the coupon in next week's issue.

'No-one beats our prices'

Melvin Beresford, whose company is bringing out a 16k RAM pack for the Jupiter Ace next month, has made this promise: "If someone comes out with one that's cheaper we'll cut our price. And that applies to all our products."

Mr Beresford, 37, chairman and managing director of Cheetah Marketing, expects his £24.95 Jupiter Ace RAM pack to be ready by April or before.

He said: "I think it will be the first — and certainly the cheapest."

He said he kept prices down by paying his sub-contractor's tooling costs of £4,000 to £5,000 for the casing and by using automated production. Some companies, he said, bought ready-made cases; his were specially designed for the job.

At present Cheetah sells two RAM packs for the ZX81 — 16k for £19.75 and 64k at £44.75.

He is hoping for an April launch for a 32k RAM pack for the Spectrum at around £30, which would mean customers could add it to a 16k Spectrum (£125) and get a 48k model at £20 less.

Cheetah Marketing is Mr Beresford, his wife Levey, 26, and the company secretary, two sales staff and a marketing executive. Mr Beresford, formerly in production in an electronics company, formed Cheetah four months ago.

Cheetah Marketing, 359 The Strand, London W 2R OH's.

New for the BBC

BBC software specialists Acornsoft has five new games to launch this month.

And one of them, according to managing director David Johnson-Davies, has beaten everyone at the company.

All five are priced at £9.95 and run on the BBC model B.

They are: Snooker, a two-player game including features like top and bottom spin, Missile Base, Starship Command and Draughts/Reversi, which use joysticks, and an adventure game, Countdown to Doom.

It is Draughts/Reversi of which Mr Johnson-Davies said: "It's beaten everyone here."

He also said Starship Command was totally original: "The attacking ships behave in an intelligent way — they gang up on you."

Castle of Riddles, an adventure game released last month, includes a £3,000 competition for which the closing date is March 31.

Acornsoft, 4A Market Hill, Cambridge CB2 3NJ

Computer talk in the nursery

Just for children, Electroplay has introduced a £50 micro called My Talking Computer.

It has just 30 one-word keys, its own small colour display screen, runs on batteries or mains power and has plug-in program modules with names like Spelling, Music and Languages.

Electroplay says it has been designed as a child's first computer and is suitable for youngsters of three and upwards. It says "hello" when turned on and then the child presses keys as instructed.

In a chauvinist announcement, the company says it is a computer for kids and mothers... mothers will not feel they have to be computer boffers to feel at ease with it or use it with their children.

Electroplay, producers of Pass Me, "the first talking electronic game", says that My Talking Computer has attracted orders of more than 25,000 from America and potential larger orders for France.

The company says My Talking Computer was designed and assembled in England.

Electroplay, first floor, 93 High Street, Esher, Surrey KY10 9QA



My Talking Computer speaking to children

What Katy did for Dad



Law Graham and daughter Katy — facing up to programming



Katy Graham, a 14-year-old schoolgirl, loves making faces for her dad.

She designed the faces on two of Law Graham's programs for children of four-six — a grin or a grimace on one and an alien with meaningful antennae on another.

Mr Graham, who runs Cottage Software with his wife Margaret, is a maths teacher at a comprehensive school and has an engineering degree.

He said: "Katy has been very useful at finding bugs. She designed the faces which appear as rewards when children get the answers right. I think it's important that a child gets a pat on the back."

Katy, who is studying for O-levels, said: "He kept making a fuss about the shape of the faces."

Isn't it unusual for a girl to be writing programs? Katy said firmly: "I think it's totally irrelevant whether you're a girl or a boy. I just enjoy it."

Now Katy, who has a brother, Andrew, aged 11, and a four-year-old sister, Ruth, has written a program for herself to help with her Latin declensions.

Mr Graham set up his part-time business six months ago and now has four educational cassettes, each with two programs, and a fruit machine game on sale, all for the 32k BBC micro.

Would he eventually have to make it a full-time job? He said: "I would not like to be out of teaching entirely because it keeps you in touch."

"I write the programs in the living room. When the family want to watch TV they have

to use the black and white set in the kitchen."

Mr Graham's latest programs are Elem-Add and Elem-Sub, both on the same cassette for £7.50.

Cottage Software, Heather Cottage, Selly Hill, Whitby, North Yorkshire

New calc for Spectrum

Chartered accountant David Robinson has brought out a £9.95 Spreadsheet program for the 48k Spectrum, called Flexicalc.

He says these features distinguish it from the others: user control over the number of rows and columns, formulae can be changed at any time, full manual designed for first-time users, on-screen prompting of commands and full maths capability, not just add, subtract, divide and multiply.

Mr Robinson, 33, who runs Saxon Computing part-time with his wife Denise from their home on Humberside, said: "I wrote it for myself to use originally."

Mr and Mrs Robinson, who have children of six and eight, formed Saxon as partners 11 months ago.

They are soon to put on sale consolidation and report generator modules, at £6.95 for the two on one tape, which will work with Flexicalc-generated files.

Saxon Computing, 3 St Catherine's Drive, Leconfield, Beverly, Humberside

A NEW SERIES FOR FIRST TIME USERS

"Learning to Use" is a new series of books which introduces newcomers to the most widely used micros in the marketplace.

The books assume absolutely no knowledge about computers and the reader is shown even the most fundamental operations such as "switching on" and "loading a program". The books lead the reader through simple programming and then on to graphics, with several programs which show how to achieve pictures and even animation!

The user-friendly approach is consistent throughout the text - not only are program listings clearly shown, but in many cases, a photograph is included to show what the program looks like when actually loaded and run!

All books in the series are £5.95 (incl. postage) **Gower**



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More micros on the way



The VZ200, alias the TX800 — ignore the name on the panel



Richard Abbott — importing two new computers

Textet, best known for its pocket calculators, is challenging Sinclair's Spectrum with a Hong Kong import.

Called the VZ200, it will be on sale here in May/June. John Menzies, Textet's owners, and, through importers Leisure-Zone in stores like the House of Fraser group.

Textet will be calling it the TX800 — it has 8K of RAM. Price will be £98, but this may well be discounted by some stores.

It comes with a rubber-like keyboard, BASIC, eight screen colours, single-key commands, user-defined graphics and a range of add-ons, some to follow later.

They will include a plug-in 16K RAM module at £39.95 with 64K later at £49.95, a joystick for £14.95, light pen and a £99 printer. A Centronics-type adaptor is also due. Textet will also be offering a monitor made in Taiwan.

Leisure Zone managing director Richard Abbott said three software houses were writing for it and 40 programs would be available at launch, including games, educational, home, small business, scientific and technical. There would also be a simple spreadsheet.

He said "I think its market is the one that's been established

by Sinclair — the hobbyist, the student and the enthusiast. It's for someone upgrading from the ZX81 who can't afford a Spectrum.

Leisure-Zone is also importing another computer, called the Creation, also from Hong Kong and made by the same company. Modular in design, it will cost £99.95, is aimed at the whole family and will run VZ200 software.

A cassette recorder at £39.95 — it will not work with others — plugs into the side and so do memory modules of 16K, at £39.95, and 64K. A floppy disc drive and acoustic coupler are due later. Joysticks will cost £19.95.

A Sinclair spokesman said "We concede that there is room for newcomers in a growing market. Our share of that market may decline but our sales will continue to rise."

"We have yet to see a serious head-to-head challenger materialise against us."

● Textet's proud claim is to have brought out, in 1971, the first pocket calculator — three weeks before Sinclair. Mr McCormack said: "We will send a writ to anyone who says differently."

Leisure-Zone, The Old Malthouse, 5 The Broadway, Old Amersham, Bucks HP7 0HL. Textet, Textet House, Earl Road, Commercial Avenue, Stanley Green Industrial Estate, Cheadle Home, Cheshire SA8 6PT.

More Dragons on the way

Experts are already at work on a replacement for the best-selling Dragon 32, just seven months after the launch.

It is one of several projects

being tackled by Dragon Data's 16-strong technical development department at the company's new Port Talbot plant.

But sales boss Richard Wadman, 44, said: "I see the Dragon 32 lasting for some considerable time — I wouldn't be surprised if we were still selling it in 1985."

When we bring out a replacement depends on what the opposition does and the way the market goes.

"We've got to consider a machine to come for the bottom end of the market and that's on the drawing board."

Dragon Data's 138 workers are now turning out 20,000 micros a week and 55,000 have been sold since August. Mr Wadman reckons they need to produce 30,000 a month to keep up with demand.

He said: "Demand is growing all the time. There's going to be a struggle for all computer manufacturers to satisfy demand in the next couple of years."

"Most of our purchasers are first-time buyers, with a few trade-ups, so we seem to be producing a lot of new business."

Soon the micro will take its place in the home like the TV or the hi-fi. The requirement of the user will be heavily software biased. They will require it to do something for them so we need more plug-in facilities, like electronic shopping, banking and databases.

"I'm not happy with the amount of software at present but we are improving our range quite rapidly in the next few months. After all, we only started in August."



Dragon Data's logo reflects its Welsh background

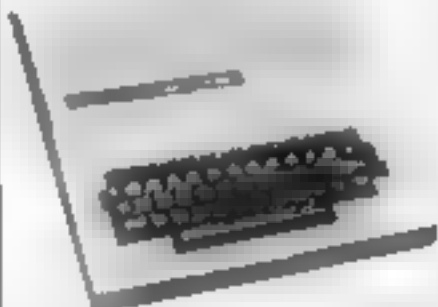
Mr Wadman, a bearded lecturer in statistical computing, said: "We are now beginning to establish a healthy export market in Europe."

"We are also negotiating with people in the States. We have been talking to a large distributor and manufacturers.

I would prefer to make it here for export, but there are price advantages in having it made under licence."

These are the products Dragon Data already has lined up.

● A disc drive at £250-£275 to be launched next month. One drive with controller will have a 5 1/4 in single-sided 250K floppy. And there will be space in the same box for a second drive costing around £200. Other companies are also bringing out disc drives for the Dragon.



Dragon 32 — "... still selling in 1985"

● A £25 tape recorder, brought in and specially adapted. Due for release at the end of next month, Mr Wadman said it was being marketed following devaluation.

● Boards with 64K of RAM and a multi-tasking disc operating system, called OS9, also next month.

● A new model for more serious users called the Dragon 128, priced at around £400 and for launch in August.

● A top-range model, designed as a system and costing between £1,200 and £2,000. This will be for the professional user and is scheduled for September or October.

● Two graphics printers, using 4 in paper for 40 columns and 8 in rolls for 80 columns, costing about £150 and using tiny ball-point colour pens. A release date has not yet been set.

Dragon is forecasting a turnover of £35m-£45m this year with profits of £3m-£4m, which would make it one of the UK's biggest micro companies. Turnover to the end of December was £3m, giving a profit of £200,000 to £300,000.

Dragon Data, Kenfig Industrial Estate, Margan, Port Talbot, West Glamorgan SA13 2PE.

Colour print at a budget price

This attractive little printer which arrives well packed in polystyrene, measures just 8½in square and 3in high at its maximum. But you get a lot of value for your £.49.

There should be no problems connecting it to a wide range of micros with standard parallel or serial outputs. One dealer told me the printer, called the CGP 115 by makers Tandy, was very popular with BBC micro owners.

Setting up is easy. All that's needed is a mains plug for the separate power supply and the appropriate cable to connect the printer to the computer.

To get the printer going you have to set switches to select the relevant input — serial or Centronics parallel — the default for 40 or 80 characters per line and load the 4½in paper roll and pens.

A roll of paper and six special ballpoint pens, three black and one each of red, green and blue, are included.

All this is straightforward and well explained in the 40-page manual which is supplied.

When you switch the printer

Remarkable feats can be performed by a tiny newly-launched four colour printer/plotter which uses ballpoint pens. Peter Tootill reports

on it makes an alarming buzzing noise for three or four seconds. This had me rushing to the phone to call the Tandy man to check if it was about to go up in smoke.

Fortunately it is just part of its start-up routine. I assume it is vibrating the pens to help them to start quickly.

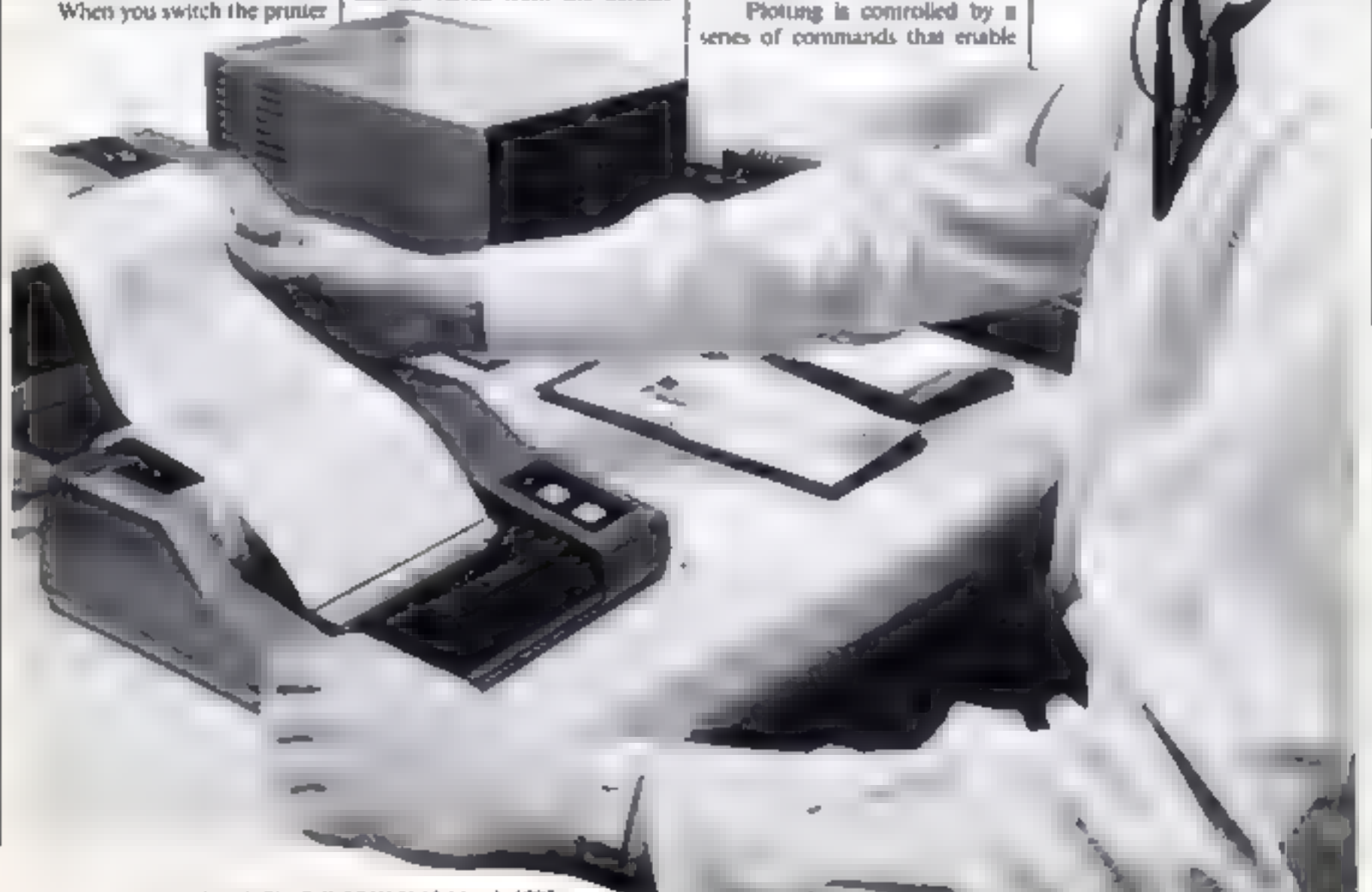
The next thing it does is to draw four little boxes, one in each of the four colours. Having made sure that everything is working properly the printer is now ready for use. Using the printer for text is easy. The output is simply sent to the printer using the normal `LPRINT` for your computer (or `LPRINT` on the TRS-80). The number of characters per line can be varied from the default

value of 80 or 40 characters per line under software control. The range is from 80 to produce letters which, although only about 1mm high, are still quite easy to read, to one. Yes, I do mean one character per line.

The characters for each size of output are all in the same proportion, so that as the number per line decreases, the height of the characters increases. This is different to the normal method of working for dot matrix printers which normally double the width of characters but keep the height the same.

Plotting is controlled by a series of commands that enable

the pen to be moved from point to point with or without drawing a line. The destination is specified by giving displacements, either relative (from the present loca-



HARDWARE REVIEW

tion), or absolute (from the currently defined origin).

The manual explains each command well, but there is a lack of more advanced examples, especially in the use of variables to specify the various actions the printer should take. This is a pity as it will be the basis of most of the work that the printer will undertake.

A few simple examples, such as how to draw a circle, or some geometric patterns would have been very helpful, especially to the non-mathematical user.

There is a very nice program in the manual that draws a pie chart, and colours in the sectors, and also produces sine and cosine curves. However, it contains a couple of bugs, and a lot more R2:Marks would have made it much clearer which sections of the program are carrying out the various actions.

Nevertheless, this program will amply reward careful study with a number of hints on how to use the printer's capabilities. It is easy to output text whilst in graphics mode, and the text can also be printed sideways. Of

even upside down. Unfortunately priced and versatile the printer's main drawback for general use is its speed, only 12 characters per second when printing. But at the price there is little competition and it should appeal to a wide range of users, not just those who

need to produce graphs and diagrams. Interfacing to different computers shouldn't present any problems, especially as it supports both serial and parallel inputs. However, none of the connectors to various pins on the input sockets are given in the manual.

Facts and figures
 Tandy CGP-115 printer £149
 Paper (three rolls) £3.99
 Pens (pack of three all black, or one each of red, green and blue) £1.69
 Inputs: Centronics parallel and RS-232 serial (600 baud, 7 bits, 2 stop bits)

Test run character set at 80 and 40 characters per line plus graphics demonstration

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LSI 40 x
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TRANSISTOR 20 x
DIODE 10 x
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Our story begins with a ZX80 in a back room . . .

It's almost a computer classic, but Nick Lambert really did start his business in a back room. Then it spread to two rooms and finally took over most of the house.

Now Nick, 32, is managing director and major shareholder of Quicksilver, the Southampton-based software house with a catalogue of 39 tapes by the end of the month and a turnover predicted to reach £5m-£10m next year.

Nick spent £90 on a 1k ZX80 and decided to make his own 3k memory board for it instead of waiting for the Sinclair Research version.

He said "I thought I could sell it so I took space in a magazine. That was my first toe in the water. In three to four months I sold about 400 of them at £40 each compared with Sinclair's price of £62.

"I was an arcade games freak and no-one seemed to be providing them so, with Rodney Zaks' book in one hand, I wrote Defenda and sold it at £5.50. I was also selling a motherboard and a sound board.

John Hollis, now Quicksilver's technical director, was working in a components shop when Nick met him while buying bits and pieces for a synthesiser project he found in a magazine. He never did finish it.

And Nick met Mark Eyles, now production director through a friend who said Mark was good at soldering.

Quicksilver became a limited company in April last year and the staff is: Sean de Bray, technical administrator; Caroline Hayon, sales and marketing; Rod Cousens, international sales manager; Susan Clifton, secretary and Maureen Twine, post.

Now Quicksilver has been trading for 18 months and has offices on four floors overlooking a park.

The company has a catalogue of 23 tapes, nearly all machine code games, for the Spectrum, ZX81, VIC 20, plus a character generator for the Atari.

This month another 16 are being launched, including programs for the BBC micro and the

Quicksilver is one of the country's fastest growing software houses. Paul Liptrot traces its growth and talks to the people who run the company about their plans

Dragon. Among them will be a word processor and a music program. Prices range from £3.95 to £7.95 and up to £14.95 for specials.

Mark said "When we are

doing our pricing we look at how much it's going to cost to produce and at the prices the others are charging and we try to arrive at a realistic figure.

"When we started we were



Alan Laird — he wrote Munchies for the ZX81



John Hollis — technical director and writer of Time Gate



Martin Walker — wrote the Magic Window character generator for the Atari



Sean de Bray — Quicksilver's technical administrator

charging £5.50 for a ZX81 program and copying it ourselves. Now the same program would cost £3.95 because we are selling more of them.

"We have tried to keep our prices down to the lowest which are reasonable. If we were selling a program for the ZX81 and then brought it out for the Atari we would have to charge a different price because there would be more to it.

"The machine that I personally like the look of is the Lynx but we will be producing for all the personal computers. That's our plan. We are just like book publishers, publishing the work of mainly freelance programmers.

"Every two months our turnover has doubled — that's the kind of rate we're growing at. It's absolutely fantastic.

"We've probably got the dubious distinction of being ripped off in almost every country in the world. Now we've got a large firm of accountants with offices in the countries to which we export."

Among the countries Quicksilver sells to are Iceland, Chile, Australia, Holland, Denmark, Israel, America, South Africa, Spain, Belgium and Greece.

Mark said "The number of people who can write programs is finite, but there's lots of them. Many of them can write well, but they are not so good at ideas so we give them the ideas to improve their games.

We are going to be holding conferences for our programmers — we'll rent a room in a hotel somewhere — and give them loads of games ideas. And we're going to produce a newsletter for them too.

"Some of them are still at school and soon they will be earning more than their parents."

He gave an example of what would happen if someone sent them a tape for the ZX81.

"The market is going to disappear before long because of the Spectrum, so we would say 'This is a really nice program. Could you write it for the Spectrum?'"

"We would provide him

PROFILE



Mark Eyles — "We try to keep our prices down"

with a Spectrum, a monitor, and an assembler and a program of routines called Sub Lib. He would pay us out of his first royalties. That's the kind of support we give."

Quicksilver's programmers, mostly freelance, get 25 per cent of the cover price of each program, excluding VAT.

Among them is Alan Laird, a 15-year-old Ayreshire schoolboy now taking his O-levels, who wrote Munchies for the ZX81. Another is Martin Walker who wrote Magic Wizard, a character

generator for the Atari, at his home in Wiltshire.

Mark

said, "I

think

there

will

soon be

just a

hour's

work

software houses, but there will still be the little guy in his back room. The gap between big and small will widen.

"We want to stay fairly small in numbers of full-time staff so we can react quickly to market trends."

Nick expects Quicksilver's turnover for the year ending this month to be £1.5 to £1.8. And next year he predicts a turnover of £5m-£10m, in the UK alone.

He said, "One of the things I want to do really soon is take a couple of months off and write a

really good program

John Hollis and

myself have

this friend's

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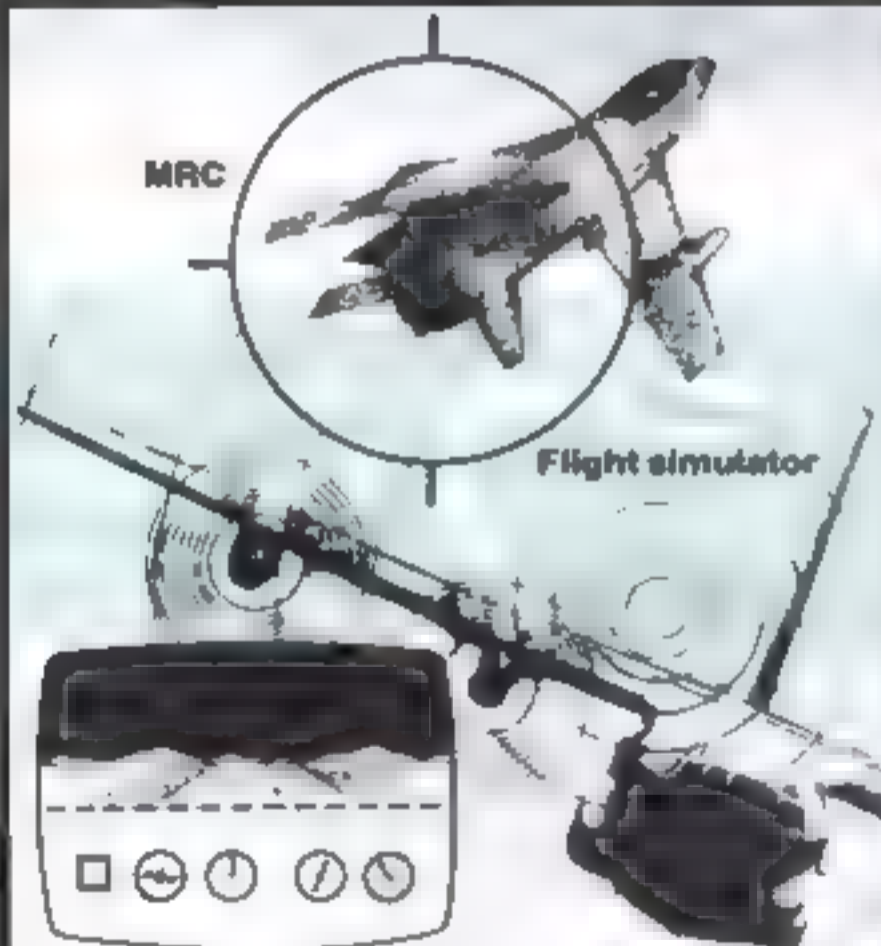
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ahead



Quicksilver's logo



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If you feel you can meet our standards, write to me (don't phone). Please name your micro, plus memory, give your occupation or training and, if under 21, your age. Include a daytime and home phone number if you can.

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```

10 MODE 7:MODE 1:MODE 0
20 DEFN Large Lettering
30 PEN 0:MODE 0:MODE 0
40 PEN 0:J.P.R. 000
50 MODE 7:MODE 1:MODE 0
60 FOR ST=1 TO 24:FOR S=1 TO 24:FOR L=1 TO 24:
70 FOR ST=1 TO 24:FOR S=1 TO 24:FOR L=1 TO 24:
80 DEFN PROC (AB,C)
90 DEFN PROC (AB,C)
100 DEFN PROC (AB,C)
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120 DEFN PROC (AB,C)
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800 DEFN PROC (AB,C)
810 DEFN PROC (AB,C)
820 DEFN PROC (AB,C)
830 DEFN PROC (AB,C)
840 DEFN PROC (AB,C)
850 DEFN PROC (AB,C)
860 DEFN PROC (AB,C)
870 DEFN PROC (AB,C)
880 DEFN PROC (AB,C)
890 DEFN PROC (AB,C)
900 DEFN PROC (AB,C)
910 DEFN PROC (AB,C)
920 DEFN PROC (AB,C)
930 DEFN PROC (AB,C)
940 DEFN PROC (AB,C)
950 DEFN PROC (AB,C)
960 DEFN PROC (AB,C)
970 DEFN PROC (AB,C)
980 DEFN PROC (AB,C)
990 DEFN PROC (AB,C)
1000 DEFN PROC (AB,C)

```

My short program contains a procedure called PROC string which will allow you to draw three sizes of characters with a BBC micro.

By changing the letter C in line 70 to t, 2 or 3 you can have characters which are eight characters high, 16 characters high or 24 characters in height.

The program will run in any mode, but remember to change the tab positions. In MODE 7 a size three character will take up the whole screen.

The program, which gives a demonstration of sizes, could be used as part of, say, a game.

The procedure sets up the eight strings MEMS(x) which are used to draw the large character.

The characters are stored in the memory as a series of eight bytes from &C000 onwards. Each number is converted to a binary string, then the zeroes converted to SPACES and the ones converted to CHR\$255 in FNconvert.

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 How? _____

Put your micro on the phone

Your micro can easily talk to other computers. All you need is some simple off-the-shelf software, a modem costing £100-£300, and a telephone.

Then you'll be able to call up other computers, get in touch with 'bulletin boards' run by hobbyists and contact large professional systems. You can also use some of Prestel's facilities.

Many of the systems run by enthusiasts offer free software to download into your computer, games-playing with other micro users and even a sort of mail order by micro.

This type of communication is set to boom as micro owners look for new ways of using their computers and big companies latch on to the commercial possibilities.

In America, where phone calls and modems are cheaper, there are hundreds of bulletin boards. The best-known commercial networks are The Source and CompuServe.

Many companies use these systems to keep in touch with their staff. They can collect messages at any time with no postal delays or misunderstandings on the phone.

There is even a network in the US called Green Thumb which gives farmers weather forecasts, market prices and so on.

Here the idea is still fairly new and there are only a few systems. One of the pioneers was Fred Brown with his Forum-80, based in Hull. It's basically a hobby system with facilities for messages, downloading software and a commercial section to buy with credit card numbers.

Others are in London, Liverpool, Oxford and Walsall. And there are several in Sweden and Holland.

The system in Walsall was set up by Tandy who were so impressed with the idea and its potential that they installed it, using a program called Mailbox-80 written by Fred Brown, to enable their shops to keep up to date on new products and handle queries.

By all accounts it's been very successful and well used. In

Dial up a bulletin board and your micro can exchange information over the phone. Peter Tootill, who runs Mailbox-80 in his spare time, tells you how

business terms such a system is cheap — £2,000 for micro, modem and software.

Most recently made personal computers have an RS-232/V.24 serial interface — check your manual — which makes them ideal for communications. There are two types of modem you can buy. One is an acoustic coupler, which means you plug your phone handset into two rubber cups. The other is wired directly to the phone line.

The same company that sold you the modem will usually provide the software too. You'll need to set your micro using the details in Table 1. Then you dial up the

bulletin board you have chosen. I have included a list of some of them. You will hear a steady tone. Plug in the handset, switch on and an introductory message will appear on your screen, guiding you to what is available on the system.

Here's how it works in more detail. A special interface is needed to convert the data transmission system a micro uses into a form the outside world can handle.

Most computers move data around along eight wires in eight bit chunks, instead of one bit at a time along a single wire.

So it is much quicker to use the parallel

eight-wire system rather than serial, or single-wire system. Both have a further wire called ground.

You need a serial interface to convert the parallel data in your computer. RS-232 is simply the US standard for serial communications and CCITT V.24 is the European equivalent and is virtually identical.

However the output from the serial interface is still in digital form — zeros and ones represented by voltages.

To transmit this data along telephone lines means converting it into sounds and this is just what a modem does. It modulates the data into tones of two different frequencies, hence the name MODulator DEModulator.

In practice four tones are used in pairs, two by the caller and two by the answering system so they can transmit at the same time. It's not the recipe for chaos. It might seem as this is used for error checking and "handshaking".

This means one system can ask the other "Are you ready for the next batch of data?" and the second can answer "Yes, go ahead" or "Hang on, I'm still dealing with the last lot".

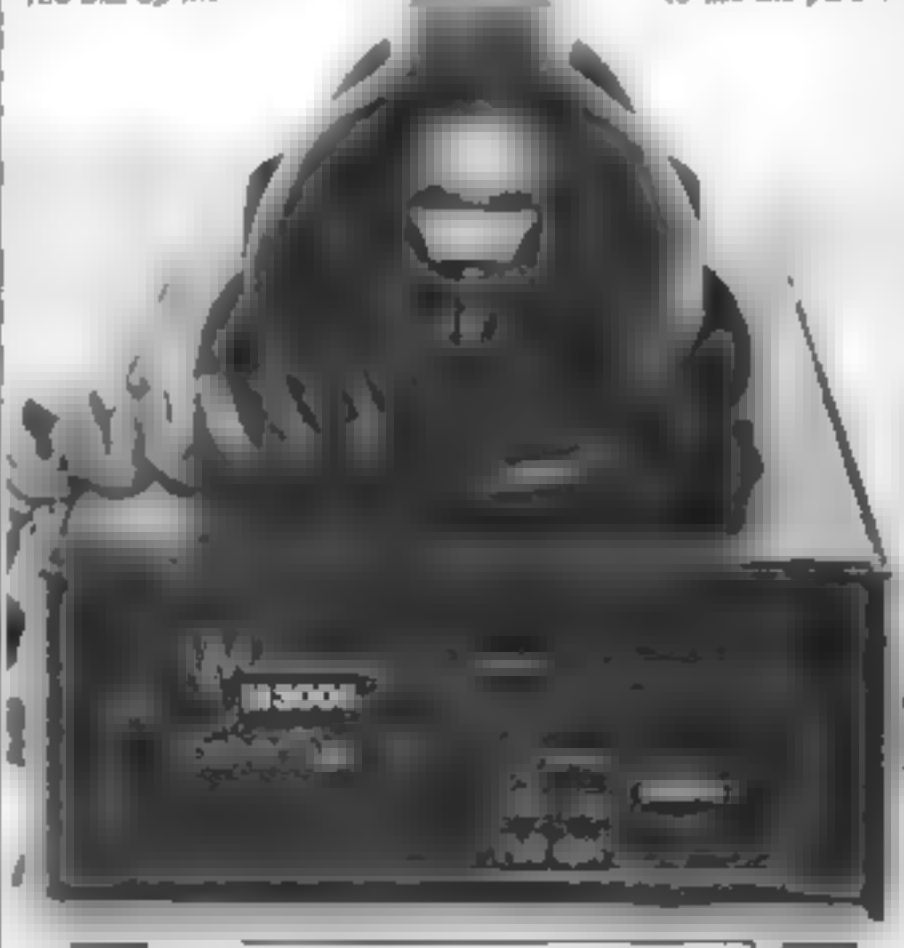
Simultaneous transmission is called duplex and a simpler system where the two take turns is called half duplex.

There is an almost universally standard way of setting up your micro to ensure it is compatible with the one at the other end of the phone line.

The standards are the code used to transmit characters, the speed at which they are transmitted and the frequencies used. In fact, the only problem comes when a European user wants to communicate with a North American system because the frequencies are different, at least at 300 bits per second. Our modems are preset to our system.

So, for trans-Atlantic communications, both ends must make sure they are using either European (CCITT) or US (Bell) standard modems.

If you want to know more about how you can join the communications revolution, contact the operator of your nearest



MiniModem 3005 acoustic coupler from Modular Technology (08692 3361) costs about £149 and will fit almost any type of telephone.

BULLETIN BOARDS

bulletin board out of system hours at the phone numbers listed in Table 2.

Or, if you have a micro and a modem, set your system to the standards listed in Table 1 and call any of the boards listed.

Keep your calls within the hours given. Most of the systems are run by hobbyists and calls at 2am will not be welcomed.

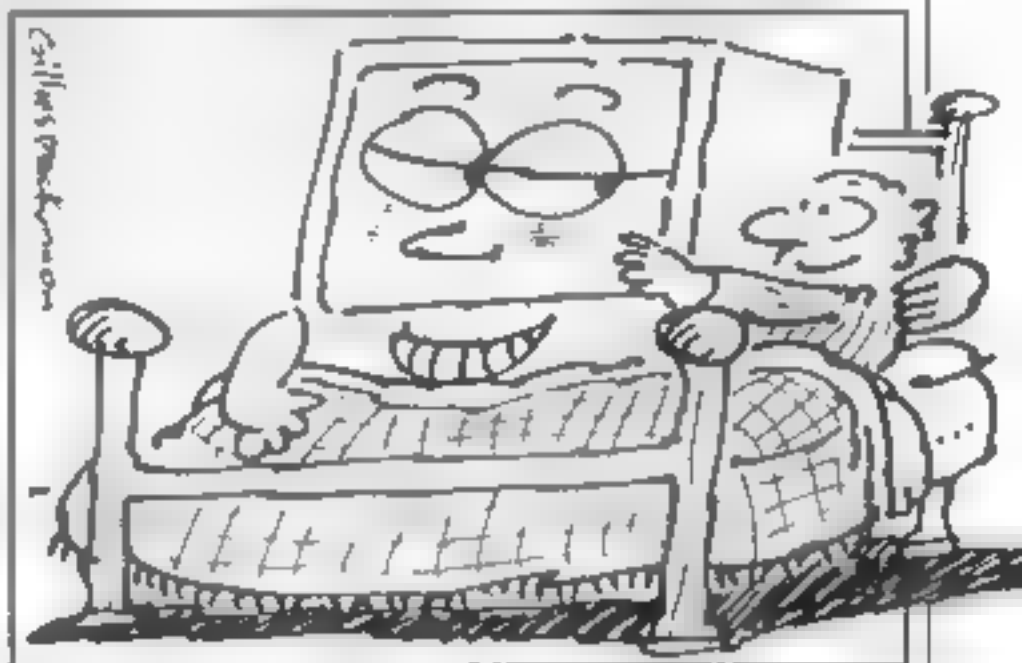
Table 1 — standard settings for communications to bulletin boards

Data speed	300 bits/sec
Word length	7 bits (excl. parity and stop bits)
Parity	Even
Stop bits	1

Shropshire	Remote CP/M	(094875) 378	Daily 1 am-3pm, 7-1pm
Kansas	Forum 80 HQ	(0101 816) 861 7040	24 hours
Chicago	CBBS HQ	(0101 312) 545 8086	24 hours
New York	Colour Computer	(0101 212) 441 1755	24 hours
Alabama	Bullet 80	(0101 205) 492 0373	24 hours

Table 2 — computer bulletin boards

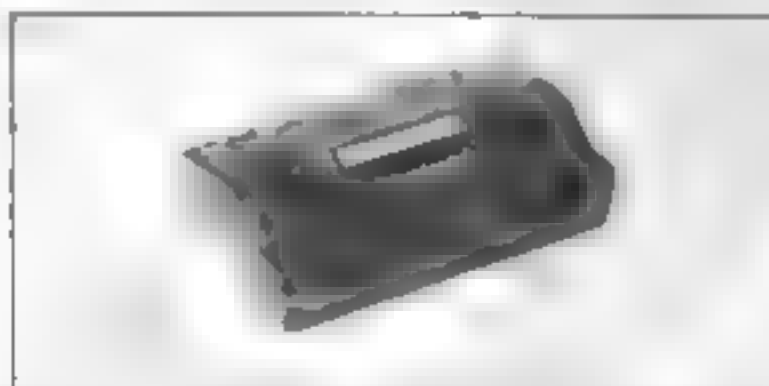
Town	System	Phone No.	Times
Hull	Forum-80	(0482) 859169	Tues & Thurs 7pm-10pm Sun 5pm-10pm
London	CBBS	01-199 2136	Mon-Fri 9am-5pm, 7.30-10pm Weekends 12.30-10pm
Liverpool	Maitbox-80	(051) 220 9733	Ring once, then dial again
Milton Keynes	Forum-80	(0908) 613004	Daily 9pm-12 midnight
Co Durham	Remote CP/M	(0207) 32447	Phone for times



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Some of these programs will also run in fast mode or on an 8K ROM ZX80, but remember to Poke 16437 with 255 after every Pause statement.

In certain listings the hash symbol (#) appears and this represents a critical space. Lower case characters represent shifted graphic characters.

Program 1 — Space Shuttle

Follow the instructions given to land the shuttle within the time limit. Level 5 is the easiest.

```

10 LET S=0
15 PRINT "ENTER LEVEL (1 TO 5)"
20 PAUSE 999
25 CLS
28 LET A=(A INKEY)
30 FOR F=1 TO 10
35 PRINT AT 19,13," "
40 LET B$=CHR$( (AND*(25)+31)
50 FOR G=1 TO A+10
55 PRINT AT 7,3,"      PRESS K
EY ",B$
70 IF INKEY$=B$ THEN GOTO 100
75 NEXT G
80 PRINT "FAILURE,MISSION ABOR
TED"
90 STOP
100 PRINT AT 7,3,"STEP  ,F,  CO
MPLETE"
105 FOR H=1 TO A+10
107 NEXT H
108 PRINT AT F+7,14,"
109 PRINT AT F+9,14,"
110 NEXT F
120 PRINT AT 7,3,"MISSION COMPL
ETE"
    
```

HOURS OF FUN: 21 PROGRAMS FOR YOUR 1K ZX81

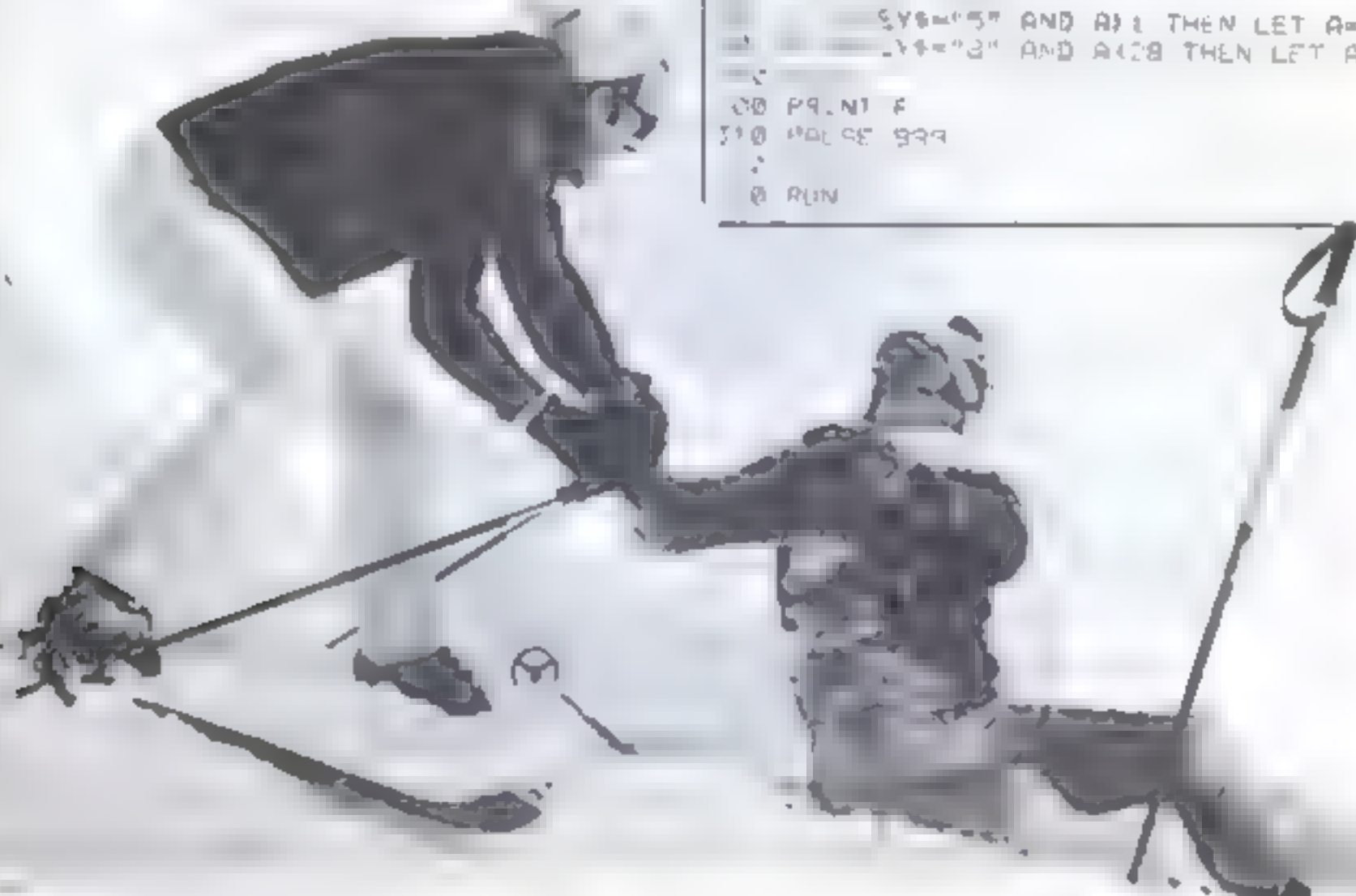
A bumper selection of programs written for the 1K ZX81 running in slow mode and presented by Dominic Stocqueler

Program 2 — Skier

This program and Program 3 illustrate the difference in speed between BASIC and machine code. Here the object is to ski as far down the course as possible without crashing in to the trees. Keys C and S move left and right respectively.

```

10 LET X=0
15 LET Y=0
20 LET Z=0
25 PRINT AT 10, AND*(25)+31
30
35
40
45
50
55
60
65
70
75
80
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880
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975
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985
990
995
    
```



ZX81 PROGRAMS

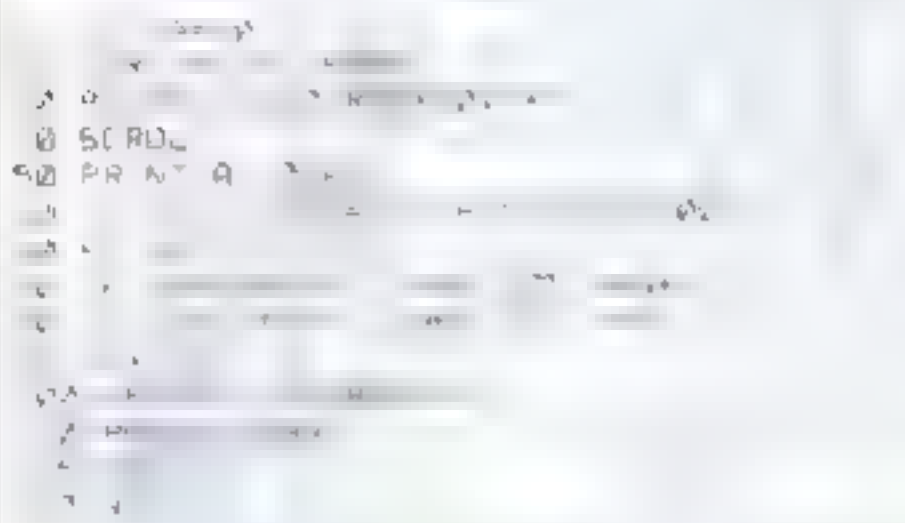
Program 3 — Starship

Machine code plus BASIC

```
10 REM
20 FOR C=1 TO 10
30 TEMPL M
40 PRINT F,M
50 POKE F,M
60 NEXT F
```

Run this short program and enter the numbers below

1 0 0 42 14 64 78 201
Delete lines 30 to 60 and add



Program 5 — Trap

Make as many moves as possible without moving onto a black square. Movement is controlled by keys 5, 6, 7, and 8.

```
10 LET A=VAL "3"
20 LET B=VAL "5"
30 GOSUB 200
40 FOR C=1 TO 8
50 PRINT AT A,B
60 NEXT C
70 GOSUB 200
80 FOR C=1 TO 999
90 PRINT AT A,B
100 IF PEEK (PEEK 16398+255*PEEK 3099)=129 THEN GOTO 190
110 PRINT "X"
120 LET P=INT (RND*4)
130 IF P=0 THEN PRINT AT A+1,B
140 IF P=1 THEN PRINT AT A-1,B
150 IF P=2 THEN PRINT AT A,B+1
160 IF P=3 THEN PRINT AT A,B-1
170 PAUSE 999
180 PRINT AT A,B
190 IF INKEY$="5" THEN LET B=B-1
200 IF INKEY$="6" THEN LET B=B+1
210 IF INKEY$="7" THEN LET A=A+1
220 IF INKEY$="8" THEN LET A=A-1
230 PRINT C
240 PRINT D
250 PRINT "END"
```

Program 4 — Mastermind

Guess the four digit number the computer holds. Each digit of your entry should

be between 0 and 9. A black square represents the right number in the right position and a grey square represents the right number in the wrong position.

```
10 LET A=INT (RND*7)
20 LET B=INT (RND*7)
30 LET C=INT (RND*7)
40 LET D=INT (RND*7)
50 FOR Y=1 TO 100
60 INPUT Z$
70 LET Z$=Z$+ " "
80 LET F=VAL A$ (1)
90 LET G=VAL A$ (2)
100 LET H=VAL A$ (3)
110 LET M=VAL A$ (4)
120 IF A=E AND B=F AND C=G AND D=H THEN GOTO 500
130 IF D=E OR D=F OR D=G OR D=H THEN LET Z$=Z$+ "■"
140 IF B=E OR B=F OR B=G OR B=H OR B=M THEN LET Z$=Z$+ "■"
150 IF C=E OR C=F OR C=G OR C=H OR C=M THEN LET Z$=Z$+ "■"
160 IF A=E OR A=F OR A=G OR A=H OR A=M THEN LET Z$=Z$+ "■"
170 IF B=F THEN GOSUB 300
180 IF A=E THEN GOSUB 300
190 IF D=H THEN GOSUB 300
200 IF C=G THEN GOSUB 300
210 PRINT AT 16,3,Z$
220 SCROLL
230 SCROLL
240 NEXT Y
250 LET Z$=Z$ (2 TO 5)
260 LET Z$=Z$+ " "
270 RETURN
500 PRINT "CORRECT IN ",Y," GUESS"
550 IF C=G THEN GOSUB 300
```



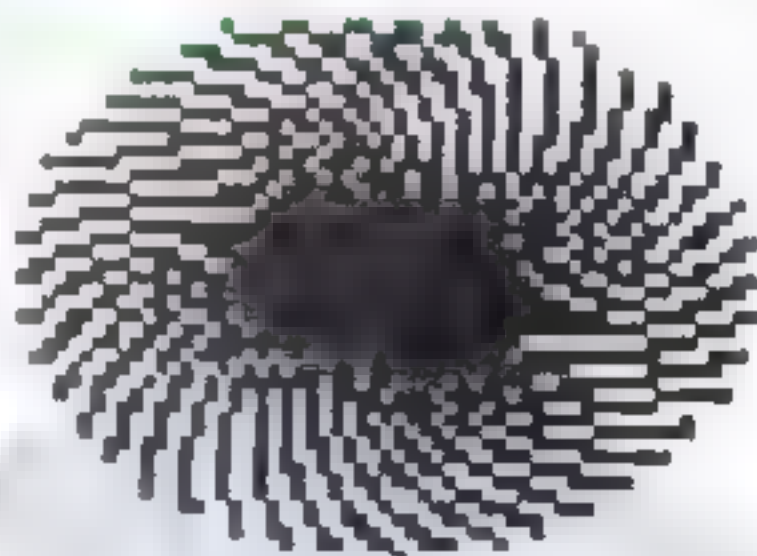
Program 6 — Chemistry

This short program will deduce the structure of an atom when given the element's atomic number and atomic mass.

```
10 PRINT AT 0,0:"CHEM 1.1"
20 PRINT AT 1,1:"ENTER ATOMIC NUMBER"
30 INPUT A
40 PRINT AT 3,1:"ENTER ATOMIC MASS"
50 INPUT B
60 PRINT AT 2,0:"PROTONS"
70 PRINT AT 2,1:"NEUTRONS"
80 PRINT AT 2,2:"ELECTRONS"
90 PAUSE 9999
100 FOR F=1 TO 3
110 SCROLL
120 NEXT F
130 GOTO 10
```

Program 7 — Pattern 1

This short listing plots the pattern you see below.



ZX81 PROGRAMS

```

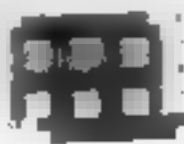
10 LET R=0
11 FOR T=0 TO 3000
12 LET X=30-R+COS (T)*2.7
13 LET Y=20-R+5*SIN (T)*2
14 PLOT X,Y
15 LET R=R+0.005
16 NEXT T
    
```

Program 8 — Fruit Machine

Try this program only if you feel lucky

```

10 LET S=VAL "50"
11 PRINT "PRESS ANY KEY TO SPI"
12 PRINT AT 5,2,"  "
13 PRINT AT 7,2,"  "
14 PRINT AT 9,2,"  "
15 PRINT AT 10,2,"  "
16 PAUSE 255
17 FOR F=1 TO 3
18 LET A=INT (RND*9)
19 LET B=INT (RND*9)
20 LET C=INT (RND*9)
21 PRINT AT 9,3,A
22 PRINT AT 9,4,B
23 PRINT AT 9,7,C
24 NEXT F
25 LET S=S-10
26 IF A<B AND B<C THEN LET S=S
27 IF A>B AND B>C THEN LET S=S
28 IF A=B AND B=C THEN LET S=S
29 PRINT AT 12,8;"YOUR MONEY=S"
30 FOR P=1 TO 100
31 NEXT P
32 IF S=0 THEN GOTO 300
33 CLS
34 GOTO 11
35 PRINT "SORRY YOU HAVE RUN OUT OF MONEY"
    
```



Program 10 —

A program to draw lines in the directions shown on keys 5, 6, 7

and 8. Key zero will clear the screen, key 9 will copy the screen if a printer is attached and keys 1 and 3 determine whether a black or white line is drawn.

```

5 LET S=1
10 LET A=30
20 LET B=20
30 IF S=1 THEN GOSUB 300
35 IF S=0 THEN GOSUB 400
40 IF INKEY$="0" AND A<62 THEN
LET A=A+1
50 IF INKEY$="5" AND A>0 THEN
LET A=A-1
60 IF INKEY$="6" AND B>0 THEN
LET B=B-1
70 IF INKEY$="7" AND B<42 THEN
LET B=B+1
80 IF INKEY$="8" THEN CLS
90 IF INKEY$="1" THEN LET S=0
100 IF INKEY$="3" THEN LET S=1
110 IF INKEY$="9" THEN COPY
120 GOTO 10
130 PLOT A,B
140 UNPLOT A,B
150 PLOT A,B
160 RETURN
170 UNPLOT A,B
180 PLOT A,B
190 UNPLOT A,B
200 RETURN
    
```

Program 11 — VAT

Enter an account name and job cost and this program will print

out in tabular form the value added tax on the job cost and VAT plus the job cost. The program also keeps running totals when "end" is entered as the account name

```

5 LET A=0
10 LET B=0
20 PRINT AT 17,0,"ACCOUNT CO"
30 PRINT AT 17,0,"TOTAL"
40 INPUT D$
50 IF D$="END" THEN GOTO 100
60 INPUT E
70 LET A=A+E
80 LET F=(INT (E*15))/100
90 LET B=B+F
100 PRINT AT 10,0,D$
110 PRINT AT 10,10,"E",E
120 PRINT AT 10,10,"F",F
130 PRINT AT 10,20,"E+F",E+F
140 SCROLL
150 GOTO 25
160 PRINT "TOTAL COST=E",A
170 PRINT "TOTAL VAT=F",B
180 PRINT "TOTAL COST+VAT=E",A+B
190 COPY
    
```

Program 9 — Guess the Number

A classic computer game with full instructions included

```

10 PRINT "WHAT IS YOUR NAME?"
20 INPUT A$
30 PRINT "RIGHT THEN"
40 PRINT "I AM GOING TO THINK OF A NUMBER BETWEEN 1 AND 100. YOU HAVE 10 GUESSES AND GUESS 1. MIN. 1 WILL GIVE YOU CLUES"
50 PAUSE 200
60 LET Z=INT (RND*100)+1
70 PRINT "ENTER YOUR GUESS NOW"
80 INPUT G
90 IF G=Z THEN PRINT "YOU GOT IT"
100 IF G>Z THEN PRINT "TOO HIGH"
110 IF G<Z THEN PRINT "TOO LOW"
120 PRINT "TRY AGAIN"
130 GOTO 70
    
```

Program 12 — Kaleidoscope

Watch the pattern build up five

by five. Variations can be achieved by altering the value of R in line 10, 1 in line 3) and the value added to R in line 60.

```

10 LET R=0
20 FOR T=0 TO 3000
30 LET X=30-R+COS (T)*3
40 LET Y=35-R+5*SIN (T)*3
50 PLOT X,Y
55 PLOT Y,X
60 PLOT Y-10,X-10
65 PLOT Y,X-20
70 PLOT Y-20,X-20
80 LET R=R+0.03
90 NEXT T
    
```

Program 13 — Maze

The aim of this game is to direct the \ from one side of the maze to the other. A harder maze is generated after each success.

```

5 LET A=VAL "30"
6 LET X=VAL "2"
7 LET Y=VAL "5"
8 PRINT AT 2,4;"LEVEL",A,25
9 FOR F=1 TO 10
10 PRINT "14 inverse spaces"
11 NEXT F
12 FOR G=1 TO 8
13 PRINT AT 1+RND*9,90+"2",G
    
```



ZX81 PROGRAMS

```

60 NEXT B
80 PRINT AT L,Y:
90 IF PEEK (PEEK (16356+256*PEEK
16399)
=128 THEN GOTO 200
100 PRINT "!"
110 IF INKEY$="5" THEN LET Y=Y-1
120 IF INKEY$="8" THEN LET Y=Y+1
130 IF INKEY$="6" THEN LET B=B+1

```

```

140 IF INKEY$="7" THEN LET L=L-1
145 IF L=L THEN GOTO 60
150 GOTO 80
160 PAUSE 9999
170 FOR F=1 TO 14
180 SCROLL
185 NEXT F
190 LET B=B-15
195 GOTO 6
200 PRINT AT L,Y "DASH"

```

Program 16 — Simon Says

The computer will flash a letter or number on the screen and you

have to enter it, plus any previous letters or numbers. If your answer is wrong the computer will show the mistakes and give a score

```

5 LET C$=""
10 PRINT "1-NUMBERS"
15 PRINT "2-LETTERS"
20 PRINT "3-LETTERS+NUMBERS"
25 PAUSE 999
30 LET B=VAL INKEY$
CLS
35 IF B=1 THEN LET A=28+INT (RND*10)
40 IF B=2 THEN LET A=38+INT (RND*10)
50 IF B=3 THEN LET A=28+INT (RND*10)
60 LET C$=C$+CHR$ A
70 PRINT C$
80 PAUSE 999
90 IF NOT D$=C$ THEN GOTO 100
100 GOTO 35
110 PRINT AT 5,0: "WRONG! THE ANSWER WAS-"
120 PRINT AT 10,3: C$
130 PRINT "YOU ENTERED"
140 PRINT AT 10,3: D$
150 PRINT "YOUR SCORE IS "LEN C$
160 PRINT AT 14,0: "ANOTHER GUESS?"
170 PAUSE 999
180 IF INKEY$="N" THEN GOTO 10

```

Program 14 — Clef

This program will print a treble clef and then print a note on one of the lines. It will then name the note and repeat the process

```

10 FOR F=5 TO 9
20 PRINT AT F,0, "-----"
30 NEXT F
40 PRINT AT 5,1, "A"
50 PRINT
60 PRINT
70 PRINT
80 PRINT AT 9,1, "G"
90 PRINT AT 10,1, "F"
100 PRINT AT 11,1, "E"
110 PRINT AT 12,1, "D"
120 PRINT AT 13,1, "C"
130 PRINT AT 14,1, "B"
140 PRINT AT 15,1, "A"
150 GOSUB 800+INT (RND*5)+10
160 PRINT AT 0,5, "O"
170 PAUSE 999
180 RUN
190 LET A$=""
200 LET B=VAL "5"
210 RETURN
220 LET A$=""
230 LET B=VAL "6"
240 RETURN
250 LET A$=""
260 LET B=VAL "7"
270 RETURN
280 LET A$=""
290 LET B=VAL "8"
300 RETURN
310 LET A$=""
320 LET B=VAL "9"
330 RETURN

```

Program 15 — Munch

possible within the time limit. Keys Q and A move up and down and keys Z and X move right and

Eat as many black squares as left

```

10 REM see line 10 of program 7.
11 LET A=VAL "0"
12 LET B=VAL "10"
15 LET Z=VAL "0"
20 FOR F=1 TO 50
30 FOR L=1 TO 10
110 PRINT AT A,B:
120 IF USR 16514=1 THEN LET Z=Z+5
130 PRINT "X"
140 PRINT AT A,B:"M"
150 IF INKEY$="7" THEN LET B=B-1
160 IF INKEY$="8" THEN LET B=B+1
170 IF INKEY$="A" THEN LET A=A+1
180 IF INKEY$="Q" THEN LET A=A-1
170 NEXT G
175 PRINT AT RND+14,RND+22:"inverse space"
180 NEXT F
190 PRINT "TIME UP"
200 PRINT "SCORE:"

```

Program 17 — Space Maze

Visibility is poor, but your mission

is to fly through a narrow gorge without hitting the sides or any other obstructions. Key S moves your ship left and key R moves it right

```

5 LET Z=VAL "10"
10 LET B=VAL "10"
20 FOR T=1 TO 10000
35 LET A$=""
40 FOR F=1 TO 2+RND*6
50 LET A$=A$+"inverse space"
60 NEXT F
70 IF RND<.2 AND LEN A$>4 THEN LET A$(1+RND*3)="X"
80 PRINT AT 10,B:A$
90 SCROLL
100 IF RND>.5 AND B<25 THEN LET Z=Z-1
110 IF RND<.5 AND B>1 THEN LET B=B+1
120 PRINT AT 5,Z:
130 IF T>6 AND PEEK (16398+256*PEEK 16399)
140 THEN GOTO 2000
140 PRINT "X"
145 PRINT AT 5,Z:"inverse SPACE"
150 IF INKEY$="5" THEN LET Z=Z-1
160 IF INKEY$="8" THEN LET Z=Z+1
170 NEXT T
1800 PRINT " "
1900 PAUSE 999
2000
2100 RUN

```


ZX81 PROGRAMS

Program 18 — Sequences

Is your brain a match for the computer? Try finding the next number in the sequence it displays.

```

1 LET K=VAL "0"
3 FOR X=0 TO 100
  R=VAL "0"
  A=INT (RAND*5)+5
  B=INT (RAND*10)+1
  PRINT AT 0,0;"SCORE=";K;" / ";X
  COMPLETE THE SEQUENCE-
  2 FOR T=1 TO 5
    GOSUB 100+INT (C*5)
    PRINT INT AT "0 ";
  NEXT T
  PRINT
  INPUT Z
  GOSUB 100+INT (C*5)
  IF Z=INT A THEN GOTO 30
  PRINT "WRONG. ANSWER=";INT A
  GOTO 100
100 LET A=R+0
  RETURN
105 LET A=A-2
  RETURN
110 LET A=A+2
  RETURN
115 LET A=A/B
  RETURN
200 PRINT "CORRECT"
250 LET K=K+1
305 FOR H=1 TO 4
  FOR F=1 TO 10
  315 NEXT F
  320 SCROLL
  330 NEXT H
  340 NEXT X
  
```

Program 19 — Junior Maths

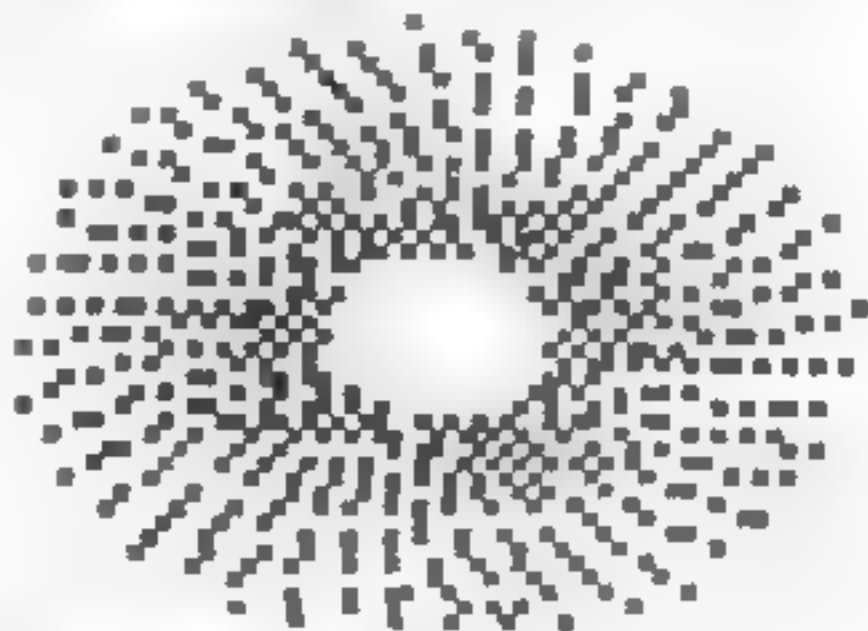
This program poses 10 simple arithmetic questions. It will also tell you how many answers were correct.

```

5 LET Z=0
  0 FOR F=1 TO 10
  20 LET A=INT (RAND*10)+1
  30 LET B=INT (RAND*10)+1
  40 LET C=INT (RAND*4)
  50 PRINT AT 0,0;"WHAT IS"
  60 PRINT
  70 PRINT A;CHR$(21+C);B;"?"
  80 IF C=0 THEN LET A=A+B
  90 IF C=1 THEN LET A=A-B
  100 IF C=2 THEN LET A=A*B
  110 IF C=3 THEN LET A=A/B
  120 INPUT X
  130 IF X=A THEN PRINT "CORRECT"
  140 IF X=A THEN LET Z=Z+1
  150 IF NOT X=A THEN PRINT "WRONG. THE
    ANSWER
  =";INT A
  155 PAUSE 9999
  157 CLS
  160 NEXT F
  170 PRINT
  180 PRINT "YOU SCORED";Z;"#OUT OF 10"
  
```

Program 20 — Pattern II

A simple program to plot the pattern shown



```

10 LET R=3
11 FOR T=0 TO 1000
12 LET X=30-R*COS (T)+2.7
13 LET Y=20-R*SIN (T)+2
14 PLOT X,Y
15 LET R=R+0.015
16 NEXT T
  
```

Program 21 — Sewer

endless sewer. Beware of touching the sides or the contents. This is not a game for the faint hearted

You have just fallen down an

```

1 REM see program 10 p 10
5 LET D=VAL "7"
6 GOSUB 2000
7 LET Q=VAL "15"
8 GOSUB 2000
10 LET A=VAL "0"
10 LET B=VAL "10"
15 FOR F=1 TO 100000
  20 PRINT AT A,B;
  40 IF INKEY="" THEN GOTO 1000
  45 PRINT
  47 PRINT AT A,B;
  50 IF INKEY=7 THEN LET B=B-1
  55 IF INKEY="M" THEN LET B=B+1
  60 LET A=A+1
  60 IF A=19 THEN LET A=0
  70 IF AND .3 THEN PRINT AT RAND*19,
    "AND"
  80 NEXT F
  1000 PRINT
  1000 CLS
  1020 F=0
  1030 PRINT "0"
  1040 RETURN
  
```



SOFTEK

SOFTWARE

Dragon's Lair and Joust MONSTERS IN HELL

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MONSTERS IN HELL Joust

If it wasn't actually a nightmare then it certainly seemed to be - trapped in Hell with the all-consuming flames below me being chased by vampire monsters through a mad maze of ladders and platforms. But I had Holy Power on my side and a hammer which could magically create holes - the only way to kill these crazy monsters seemed to be to make them fall to a lower level! But just then, the Mad Monk sent his Ghoulie after me. Any ZX Spectrum

It's taken America by storm - now it's available for your ZX Spectrum. In this amazing new arcade game you ride an ostrich and Joust with the Dark Lords on their buffaloes in a fantasy land where anything can happen - and it usually does. You control your mouse wing-flap and direction of flight in this fast and furious game of wits. Any ZX Spectrum - Available very soon

MILLIPEDE

Millipede the Millipede seemed indrastrafalbe as soon as she shot a part of her - the rest of her just kept on coming. But I was faster - she wouldn't get to me - at then I'd the spider appeared causing me to swerve and lose my aim. And who's this? - Scorpion - she's bombing me with her indestructable fleas which leave more of those blasted mushrooms to spoil my aim! Quite the most delectable version of the arcade favourite for any ZX Spectrum

Dragon's Lair

I thought it would be easy... explore the Dragon's Lair, find the legendary Crystal of power and be gone before he knew of what was happening. More fool I, for he was there all right waiting for me, and that Imp which followed me everywhere with no other seeming purpose than to steal my compass without which I was well and truly lost! The ultimate Maze Adventure game for the ZX Spectrum

COSMIC SWARM

OK, I accept that I'm to blame, I was warned against entering the Proxima Centauri Sector without an escort. And now I'm in the midst of a swarm of alien egg-like forms, collision seeming imminent I fire, they break open revealing strange alien types which fly wildly around I fire again as if my life depended upon it - then two of the forms fuse into a single mutant which chases me! One of the most original shoot-em-up space games to appear. Any ZX Spectrum

FIREBIRDS

They swoop, they dive, they turn figures of eight. The most amazing Hi-Res shoot-em-up arcade type game to come out in ages! Can you survive? Any ZX Spectrum

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SOFTWARE

SE 24

ILLUSTRATION

Save your country from atomic waste



Just you and your laser gun can rescue us from the radioactive threat in this Commodore 64 program by David Rees

Radioactive wreckage is falling all over your country growing brighter as it drops.

How many pieces can you stop before your five lives are lost?

To move your ship use the cursor keys, up for left and across for right. Key (7) releases your gun. Three different pieces drop from the top of the screen. The bar is worth 10 points, the

ring 20 points and the diamond is worth 30 points.

However, you have to destroy all the pieces. If any of them touch the ground you lose a life. When all your lives are lost, the game is over.

Conversion to most other machines should be fairly easy. Wreckage and your ship are Poked on to the screen so addresses should be changed.

However, on machines with high resolution screens, such as the Spectrum or the BBC micro, firing is easier unless you want to resort to machine code.

All lines involving colour have R#M# before them so they can be changed or removed easily. Most home computers have no need of them so lines 110-81 can probably be left out.

The program can be made to fit any screen width. AN is the screen width variable. For screens less than 12 columns AN = 5. For 32 to 61 column screens, AN = 31 and for higher values AN = 63. Line V SC should equal the number of screen columns.

My highest score is 910. Good luck and keep your head down.

```

2 REM# INITIALISE #
5 V=53248 AN=31 BH=AN#B+7 CS=40
9 REM# COLOUR #
10 AS="#####"
20 PRINT "C", " CATCH COSMOS#"
30 PRINT " BY DAVID REES"
40 L=5 X=16 S=0
50 B(0)=73 B(1)=87 B(2)=98
60 A(0)=0 A(1)=0 A(2)=0
69 REM# COLOUR #
70 POKE V+32,0 POKE V+33,0
80 PRINT "PRESS ANY KEY TO START"
90 GET B$ IF B$="" THEN 90
100 PRINT " SCORE=", " LIVES LEFT= 5
110 FOR ROW=1 TO 23
119 REM# COLOUR #

```

```

120 PRINTMID$(AS,ROW,1),
125 REM# 40 SPACES #
130 PRINT
140 NEXT ROW
150 FOR N=0 TO 39
159 REM# COLOUR #
160 POKE 56+56+N,3
170 NEXT N
180 PRINT "
197 REM
198 REM# MAIN ROUTINE #
199 REM
200 GETAS
220 IF AS="|" THEN GOSUB 500
240 C=X IF AS="X" THEN X=X-1
250 IF AS="@" THEN X=X+1

```


COMMODORE 64 PROGRAM

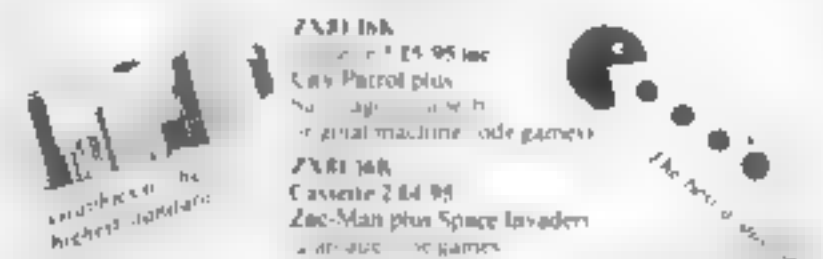
```

260 X=X AND AN
270 POKE1988+C,32 POKE1988+X,65
280 D=INT(RND(1)*16)
290 IF D=5 THEN GUSL9 700
299 REM# PIECE POSITION ADD #
300 FOR N=0 TO 2
310 IF A(N)=0 THEN 370
315 A=X(N)
320 X(N)=(((X(N)-3)*B)ANDBN)/8+3.5
330 B=Y(N), Y(N)=Y(N)+1
340 IF Y(N)>24 THEN L=L-1 GOTO600
350 POKE1024+A+B*CS,32
360 POKE1024+X(N)+Y(N)*CS,B(N)
370 NEXT N
380 PRINT "M",S
400 GOTO 200
499 REM# FIRE LASER #
500 FOR Y=23 TO 1 STEP -1
510 P=1028+X+Y*CS
520 R=PEEK(P)
530 IF R>32 THEN 600
540 POKEP,66
560 NEXT Y
570 GOTO 650
600 N=-(R=87)-(R=90)*2
610 S=S-(R=73)*10-(R=87)*20-(R=90)*30
620 A(N)=0
630 POKE1024+X(N)+Y(N)*CS,32
650 FOR Y=24 TO 1 STEP-1
660 POKE1028+X+Y*CS,32
    
```

```

670 NEXT Y
690 RETURN
699 REM# INITIALISE DRUPOING PIECE #
700 FOR N=0 TO 2
710 IF A(N)=0 THEN 740
720 NEXT N
730 RETURN
740 A(N)=1 Y(N)=1
750 X(N)=INT(RND(1)*HN-1)+4
790 RETURN
799 REM# IF PIECE HITS GROUND #
800 PRINT "M",,"LIVES LEFT=",L
810 IF L<1 THEN GOTO 1000
820 A(N)=0
830 POKE1024+A+B*CS,32
840 GOTO 370
997 REM
999 REM
1000 FOR N=0 TO 999 NEXT
1010 PRINT "M",,"YOUR SCORE WAS"
1020 PRINT,"M",S
1030 FOR N=0 TO S/100
1040 PRINT"HELL DUNE!"
1050 NEXT N
1060 PRINT"DO YOU WANT ANOTHER GO(Y/N)"
1070 INPUT AS
1080 IF AS="Y" THEN 10
1090 IF AS="N" THEN END
1100 GOTO1060
    
```

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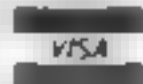
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New releases: our jury's verdicts

The court will come to order... while our jury members deliver their ratings on the latest games.



Golf Dragon 32 £7.95

Salamander Software, 27 Ditchling Rise, Brighton, East Sussex, BN1 4QL

Good value and an excellent representation of the real game, complete with handicapping and choice of clubs.

There are nine holes — go round twice for 18 — each shown first at the end of the fairway and then in close up. Use the up and down arrow keys to place your cursor in front of the ball, choose your club from the menu and then hit the space bar.

Wind direction and force on the fairway is shown by a red arrow; on the green the arrow indicates direction and angle of slope.

Shots played from the rough, shown in green, won't travel so far and shots from hazards — yellow bunkers and trees — will be even shorter. If you're unlucky enough to drive out of bounds or into a pond, both shown in red, your ball is lost and you play again from the

position of your last shot with a penalty of one.

You can play by yourself or with one other player to the standard Stableford points system used for competition golf. This is fully explained on a detailed instruction sheet. The cassette is nicely packaged too.

instructions	80%
playability	80%
graphics	85%
value for money	80%



Cylon Attack 12K Atom £4.95

A & F Software, 830 Hyde Road, Gorton, Manchester

A compulsive space game, full of thrills, but loses ratings for its limited use of high resolution graphics. The action slows noticeably as the screen is filled because only the plot and draw routines of the Atom appear to have been used.

The screen gives you a pilot's view of the flight deck with laser gunsights to zap the

Skramble VIC-20 £9.99

Rabbit Software, 380 Station Road, Harrow, HA1 2DE

Award yourself the Order of the Galaxy if you reach level eight of this challenging space game, developed from the arcade version.

After running the instructions you find yourself flying above enemy territory armed with bombs and laser guns. Use the lasers to shoot down enemy rockets and the bombs to destroy their buildings.

You must hit every fuel dump to ensure you have enough fuel to reach the game's higher levels.

The eight levels are: landscape, landscape with enemy rockets, a tunnel which tests your navigation, a cavern, meteor trail, rocket city, city maze and homing shot.

If you own a joystick use it for faster play. Key controls are @ for up, / for down, - for left, = for right and control L for laser and control B for bomb.

instructions	80%
playability	90%
graphics	80%
value for money	80%



Arcadia Spectrum/ VIC-20 £5.50

Imagine Software Exchange, Street East, Liverpool L2 3PQ

A fast-moving and colourful machine code game in the invaders mould and well up to Imagine's standards.

The dazzling screen display includes throbbing circles, bird-like creatures and spinning deltas. And they all have one purpose in life — to wipe you off the face of the galaxy. You fend them off with your laser gun and move by using the thrust key.

Fast reactions and some fancy fingerwork are needed to survive in one level long enough to reach the next.

The true test of a game like this is the "just one more go" syndrome. And with Arcadia you will find yourself suffering from just that. It is so tempting to try again.

Well packaged and well worth the money.

instructions	80%
playability	80%
graphics	90%
value for money	95%



SOFTWARE REVIEWS

Penetrator Spectrum £6.95

Melbourne House, 131
Trafalgar Road, Greenwich
London SE10.

Great graphics, super sound
and almost impossible to beat.
This version of the Scramble-
type arcade space game is one
of the best so far.

You're the pilot of a
spaceship and you have to avoid
ground to air missiles and battle
your way through four levels to
reach your target — a neutron
bomb store.

Now your problems begin
again. Your bombs — and

you've only got two — have to
be carefully aimed to fall down
a narrow shaft and strike two
small targets. Miss one and you
can bid farewell to the universe.

There is a special feature
which allows you to construct
your own terrain through which
to fly and another which gives
you the chance to train in any of
the levels. You'll need it.

One small drawback is that
the controls take time to
become accustomed to.

instructions	60%
playability	90%
graphics	90%
value for money	80%



Arcade Action Dragon 32 £3.95

Aper Trading, 115 Crescent
Drive South, Brighton, Sussex.

Two disappointing games,
Meteor Run and Breakout
but at a bargain-basement price.

Poor imagination makes the
first both clumsy to play and bor-
ing. You have to guide your
spaceship — represented by two
graphics characters — past
swarms of meteors moving up the
screen. These meteors are each
constructed out of one graphics

Other characters on the

screen also have to be destroyed.
None of the keyboard con-
trols, right, left, fire and
hyperspace, has a repeat facility
which makes moving your
spaceship tricky and cumber-
some.

Breakout also suffers from
this lack of a repeat feature. It's
just another fairly standard ver-
sion of the classic game.

It just goes to prove that, in
games as in everything else, you
get what you pay for.

instructions	40%
playability	20%
graphics	15%
value for money	25%



Salamander Software

DRAGON AND BBC MICRO 'B' SOFTWARE

DRAGON 32 SOFTWARE

DRAGON-TREE

A real-time version of the classic space game featuring full colour graphics, status and long-range scanner displays. Hyperprobe the Flying Queen, Kingpins and Kingpin commanders, reactor beams, enemy movement, black holes and much more. Choose from ten levels of difficulty and three sets of games. Comes complete with 16-page help manual. JOYSTICK REQUIRED. Dragon Data Approved.

£9.95

WIZARD WAR

A game of magical combat between the Wizards of the Tri-Suns for supremacy of the planet Kang. Both dexterity and deduction are needed in order to outwit your opponent as spells are traded against spells. Comes complete with 12-page illustrated spell book. JOYSTICKS (2) REQUIRED. Dragon Data Approved.

£7.95

GOLF

An accurate interpretation of the game of golf written by a keen club player. Allows match play between two players or the player may play using the Stabelford points system widely used for competition golf. Features full club selection, hazards, use of bounds and player handicaps. Dragon Data Approved.

£7.95

GRAND PRIX

Do you have the potential to be a champion Formula One driver? Find out when you race on these 8 famous grand prix circuits from around the world. For 1 or 2 players. JOYSTICKS 2 REQUIRED. Dragon Data Approved.

£7.95

GAMES COMPENDIUM 1

Six great games for the whole family: Downy Derby, Blackjack, Kingdom, Hunt the Wumpus, Roughs and Crosses and Lunar Lander. Dragon Data Approved.

£7.95

VULCAN MOUNTS AND CROSSES

A three-dimensional game of heights and crosses for one or two players. Also includes a zero player option where the machine plays itself. Can you out-think it? £7.95. Dragon Data Approved.

£7.95

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HCW 2



Micros are the new school books

Once upon a time there was a school which owned an encyclopaedia. It was very proud of its encyclopaedia as it was the only book in the school.

In fact it was the only school in the area with any books at all. Every parents day the teachers dusted the book down and showed it to all the parents, telling them what wonderful things could be done with it.

They told them how books, now printing was invented, would revolutionise office, and how — now information could be passed between one academic and another — new breakthroughs would be made in research.

They kept quite about the fact that, as there was only one book in a school of 300 pupils, the average child would be lucky to get more than a few hours a year in which to read it.

Anyway, most pupils did not read at all. Only a few clever ones were allowed anywhere near it to unravel its mysteries.

Does this sound familiar? Isn't this the situation now with computers in schools? Will schools ever achieve their aim of making their pupils computer literate with only one computer among so many?

Yet, surprisingly, advances are being made, though this may be partly due to so many parents now buying computers for their children. However, real advances will not be made until each school has at least one classroom of around 20 networked computers, or ideally one computer per child.

This is not a pipe dream. The microcomputer industry is growing fast and computer available now are at a price and specification undreamed of a few years ago.

Already the most recent machines being released are bearing a closer and closer resemblance to books in both price and looks.

The new Epson HX20 is portable and A4 size — the size of most magazines — and it is light and its price is less than half that of the Osborne.

The ZX Spectrum is, of course, smaller still and light to carry and at £125 is more comparable to the price of books.

How long will it be before someone brings out a portable

Send your letters to Letters, Home Computing Weekly, 145 Charing Cross Road, London WC2H 0EE. Queries cannot be answered on this page

version of the Spectrum? There are even rumours that Sinclair himself will be bringing one out this year.

If you agree that computers will soon become equivalent to the paper in books, where is the writing in the books going to come from? Advances in microelectronics have always been much faster than advances in software as software is so labour intensive and packages take many person-years to write.

This is where the problem, if any, might occur as 99 per cent of all educational software is either haute cuisine (small portions of exotic fare at inflated prices) or the result of the first year cookery class (they are practising on the customer; you may be lucky or you may get poisoned).

What we need is a McDonald's of software — professional but affordable.

If you discount so-called courses of only three programs, which are more equivalent to a chapter in a book or a lesson in a course, there are not many left.

In fact the only regularly advertised courses of computer programs of any significant size are a course in German from Wida Software and two math courses from my own firm.

I wonder how many books will be left in schools by the end of the century.

Mrs Genevieve Ludinski, proprietor, LCL, 26 Aynsley Avenue, Staines, Middlesex.

Small letters for my daughter

I recently purchased a BBC model B microcomputer and bought at the same time the Early Learning tape produced by the BBC Publications. I thought it might be suitable for my five year old daughter.

Of the five programs on the tape the only one that appeared to be aimed at her age group was the spelling one entitled Funny Man. And yet it proved unsuitable because children of that

age group are taught to spell in lower case letters and not in capitals as the program uses.

I asked for help from the computer whizz kid son of a friend, but he was only able to alter the program so that it would accept words in small letters, but the mistakes were still printed in capitals.

I wonder if any of your readers have been able to crack this one and I would be grateful for any advice on how to alter the program.

The only other program I have got so far is one called Sweep, by Microcomputer Software. Once I had got over the embarrassment of complaining to the shop that when I loaded it the computer spat it out as a bad program, and been informed ever so politely by the shop assistant that the machine code program had to be entered as per the title, I found it to be very enjoyable and well worth the £7.99 I paid.

Dr P. C. Drennan, Weybridge, Surrey KT13 8DL.

Helping the Dragon

The Dragon Independent Owners Association was launched on February 1 and we are confident it will serve a need among owners of the Dragon 32.

We intend to publish a monthly newsletter which will allow members to share tips and knowledge. We will also be offering discounted program tapes.

Doug Bourne and Dave Winkle, organisers, School House, Severn Road, Rayleigh, Essex S6 4PY.

Give me the facts

I am looking around for a computer to buy and I am willing to spend up to £300. I have looked at a lot of the advertisements and collected mounds of brochures.

But they all tell you how wonderful the machine is, without going into enough detail

I want to know things like how many sound channels it has got, the resolution of the screen and so on.

Surely it must be easy for the computer manufacturers to include these details? Unless the specification changes so often that they go out of date!

Chris Roberts, Wakefield, Yorkshire.

New keyboard or new micro?

I'm getting fed up with my ZX81 because it takes so long to enter programs on the miniscule keyboard with those flat keys.

Friends have told me that there are several keyboards available which will fit my machine. Can any of your readers advise me on the ones which are best?

Or should I cut my losses and go out and buy a computer with a proper keyboard?

John Griffiths, Richmond, Surrey.

Have you seen my micro?

At least one of the American macro magazines runs a column where the numbers of stolen micros are displayed for the benefit of dealers.

If you should do the same perhaps you would start the ball rolling with my BBC model B. The number is 119843. It can be easily recognised as the cassette programs do not work.

Dr B. Row 38 Wykeham Way, Burgess Hill, West Sussex, RH15 9HF.

Let's get serious

Nearly every software advertisement I see is for games. Now I know people say that most people buy computers for games initially. But there must be some programs around for more serious use at home.

I would like to learn French, plan my household budget, keep a record of my friend's addresses and birthdays. Such a program could warn you several days in advance when you need to buy a present.

Come on, software firms, — let's get a bit more serious.

Ms Jane Evered, Streatham, London SW16.

Flash Atari can turn upside down

More unexplored features of Atari computers. Philip Bramley shows how to use three of them with listings to type in



It's amazing what you can find tucked away in Atari computers if you look carefully

Did you know that you can have flashing text? Or that it is quite easy to switch inverse messages on the screen back to normal, and even turn them upside down?

The secret is memory location number 755, whose official Atari name is CHACT. This stands for character control, and certainly gives you that

Only the lowest three bits of CHACT are used. Bit 2 is for vertical reflect, Bit 1 for video invert, and Bit 0 for video blank. So the highest significant value that can be POKEd into the location is 7, when all three of these bits are high.

Any higher value that you try to use up to 255 will be accepted by the computer, but it will still only refer to the lowest three bits when reading it for its own information. This applies to many Atari locations and explains many mysteries that appear in readers' letters.

For instance, if you enter GRAPHICS 1000, the machine ignores the higher bits that mean nothing to it.

GRAPHICS 1000 =
GRAPHICS 512 + 256 + 128 +
64 + 32 + 8

Of these, only the 8 and the 32 are understood, so the computer interprets the instruction as GRAPHICS 8 + 32. Simple isn't it?

Anyway, back to our flashing text. The default value of CHACT is 2 (Bit 1 is high), and

so any characters printed using the Atari key will appear as inverted (negative) versions of the standard ones. If you POKe 755, 0 then all of these characters will change to normal.

Now comes the interesting part. Bit 0 (The "I" bit) controls

video blank so that any Atari key symbols disappear. They are still stored as information in the part of RAM user memory reserved for the screen data, but only the background colour is displayed.

So, if we POKe CHACT with alternate values of 1 and 0,

all of these characters will flash off and on. A simple example is shown in Listing 1.

Bit 1 controls inverted video, and so characters can easily be made to change from normal to inverse. It is very useful to be able to flash between these two modes. Text can be highlighted, and error or warning messages made to stand out much more, especially if the screen colours and sound capabilities are used as well. Listing 2 illustrates one way of doing this.

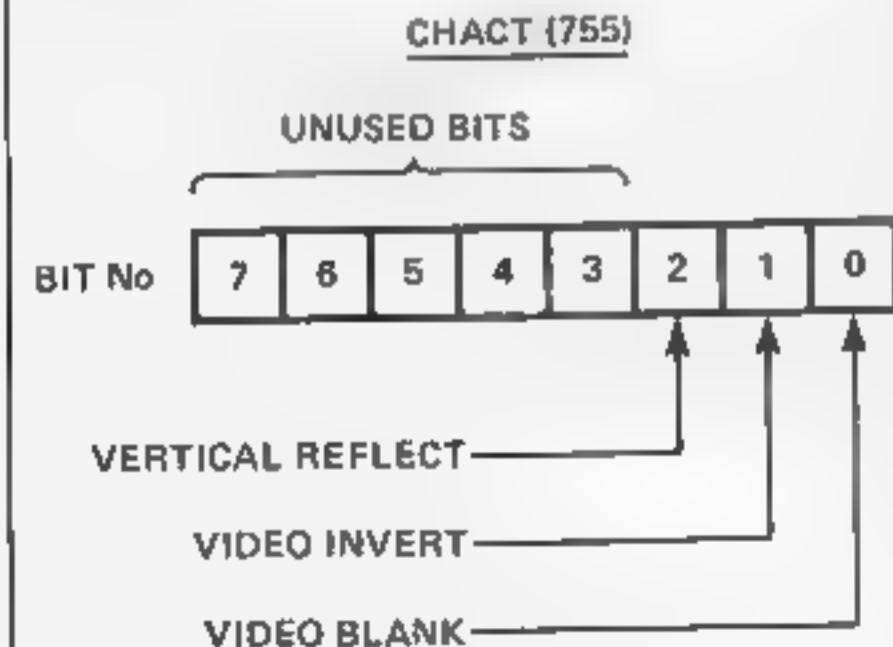
Atari owners may already know the other POKes used. Line 110 switches off the cursor, and LINE 130 clears the location which stores the code for the last keyboard character pressed. LINE 210 then loops back to itself until the key is pressed.

Bit 2 is a bit more unusual, as it causes every character on the screen to turn upside down. Try a POKe 755,4. Once the novelty has worn off, you begin to wonder what possible use it could be.

Various things have been suggested. Card games could use upside down characters for the bottom of each card, with normal characters at the top. In games, reflections in mirrors and pools could be created by using the reflect bit on the bottom half of the screen.

This causes a slight problem, as CHACT applies to the whole screen, and since the computer redraws the whole screen image 50 times a second, we would normally have quite a job to change the value in CHACT at the right time every 1/50th of a second.

I say normally because Atari



Memory location 755 — called CHACT by Atari

Listing 1

```

100 GRAPHICS 0 : SETCOLOR 2,0,0
110 POKE 755,0
120 POSITION 7,5
130 ? "NORMAL TEXT AND GRAPHICS"
140 POSITION 6,8
150 ? "FLASHING TEXT AND GRAPHICS"
160 REM ENTER LINE 150 AS INVERSE CHARS.
170 FOR W = 1 TO 100 : NEXT W
180 POKE 755,1
190 FOR W = 1 TO 100 : NEXT W
200 POKE 755,0
210 GOTO 170
    
```


PROGRAMMING

has designed into the computer a very powerful capability — the Display List Interrupt. It enables you to stop the computer part way through drawing the screen,

insert a short machine code routine, and then carry on drawing the screen as if nothing had happened.

We can therefore instruct it

```

100 GRAPHICS 0 : SETCOLOR 2,2,2
110 POKE 752,1
120 POKE 755,0
130 POKE 764, 255
140 POSITION 9,5
150 ? "ZYLON FIGHTER CRAFT IN SECTOR"
160 POSITION 9,10
170 ? "STARBASE ON RED ALERT"
180 REM ENTER LINE 170 AS INVERSE CHARS
190 POSITION 13,15
200 ? "PRESS ANY KEY"
210 IF PEEK (764) = 255 THEN 210
220 POKE 755,2 : SETCOLOR 4,2,2
230 SOUND 0, 25,2,8
240 FOR W = 1 TO 300 : NEXT W
250 POKE 755,0 : SETCOLOR 4,0,0
260 SOUND 0,50,2,8
270 FOR W = 1 TO 100 : NEXT W
280 GOTO 220
    
```

Listing 2

to switch on the vertical reflect bit half-way down the screen. Then any characters on the top half of the screen will be normal, and any below the centre line will be

reflected. Just what we need!

It is however, easier to demonstrate than to describe. Listing 3 is only a short program, but it contains a modified display list and a display list interrupt

```

100 GRAPHICS 2 + 16
110 SETCOLOR 0,0,14
120 DLIST = PEEK (560) + 256 * PEEK (561)
130 POKE DLIST + 9,7 + 128
140 POKE DLIST + 10,6
150 FOR N = 0 TO 10
160 READ A : POKE 1536 + N,A
170 NEXT N
180 POKE 512,0 POKE 513,6
190 POKE 51286,102
200 POSITION 3,4 ?#6, "ATARI REFLECT"
210 POSITION 3,5 ?#6; "atari reflect"
220 FOR N = 0 TO 255 STEP 8
230 POKE 709,N
240 NEXT N
250 GOTO 220
260 DATA 72,169,4,141,10 212
270 DATA 141,1,212,104,64
    
```

Listing 3

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The monsters of this game are avalanches, starvation, storms and - worst of all, bad planning! A real, thinking man's adventure, Everest will test your skills of forward planning to the limit.

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ASP Software Adventure Series 2

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More monsters than you ever thought could live behind your keyboard. Wander the hills in search of gold and glory but be very, very careful where you tread. There are things here that will make your wildest nightmares look like Julie Andrews. Fancy meeting a Mind Flyer for example? Or how about shaking hands with an Asmodeus? (You do only do that once!) Treasure is here to be found though...the hard way.

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ADDRESS

..... POSTCODE

Signature..... Date.....

Try to bag the cash bags

Grab the money and run — but watch out for the rain of arrows.

My program, for the Acorn Atom, means using the Z and X keys to move a little man from the left of the screen to collect money bags on the right.

They must then be taken to the far left where a random number of points is awarded for each.

It sounds easy — except for the little matter of up-arrow signs raining down on your man from the top of the screen which, if they hit him, will cause him to lose a life.

Fortunately, there are blocks of cover at three points, but the arrows erode these fairly quickly. Each time a bag is retrieved a random amount of cover is restored to one of the blocks.

If you score more than 5,000 you're given an entirely new set of cover. But this is very difficult to do so you are given the usual three lives.

Money runner, which uses 2K for the text and 1K for

Would you risk your life for money? You can with Marc Freebury's 3K program for the Acorn Atom

graphics, is written mainly in assembler and, to save space, REMarks are not used. BASIC keywords abbreviated and several statements are placed in single lines.

For these reasons it would be very difficult to convert to other machines, although you

may like to use the ideas as a basis for your own programs, particularly for the BBC models.

As a guide, most keywords are abbreviated like this. F means FOR, G means GOTO and GOS means GOSUB. In fact, GOSUB may refer to a label, so G.a means go to a line

whose first character is a

Peek and Poke are replaced on the Atom by the more graceful ? operator. This means that ?X=Y represents the more usual POKE X,Y and X=?Y could be translated as X=PEEK(Y). There are also other combinations, like X?Y=Z means POKE X+Y,Z.

Random numbers are also a little odd — X=A R %Y+Z means X=INT(RND(1)*Y)+Z.

The numbers are sometimes prefaced with the hash (#) symbol which indicates a hexadecimal number. The code between the square brackets is a machine code routine to move all the arrows on the screen down one line.

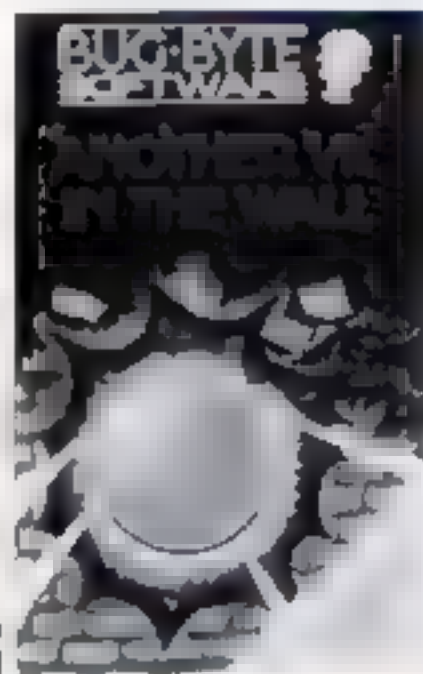
The piece at the front checks the keyboard for a key being pressed. The screen begins at hex address 8000 and consists of 16 lines of 32 characters. The little man should be designed according to the character set of your own machine, if you aren't using an Atom.

```

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Play it again — my VIC-20 favourites

Recent releases and the not-so-new Peter Richardson chooses the games he's most enjoyed on his VIC-20



Another Vic in the Wall £7

Bug-Byte, 98-100 The Albany, Old Hall Street, Liverpool L3 9EP

For Another Vic in the Wall read

Breakout — a computer games classic.

It seems quite simple on the surface but becomes compulsive, and you'll end up spending far longer playing than you intended.

Unlike most games, this one has absolutely minimal instructions. You are just told to type Load "A.V.I.T.W.", then Run. They must have assumed that the game is so well known that everyone knows how to play it. They were wrong. More instructions would be a distinct improvement.

Using paddles or the keyboard you have to bash your way through first a blue wall and then a yellow/green one.

As you progress your reactions must quicken to keep up, or you'll never get through the wall.

instructions	30%
playability	70%
graphics	60%
value for money	60%



VIC PANIC £7

Bug-Byte, 98-100 The Albany, Old Hall Street, Liverpool L3 9EP

As one of the crew of an intergalactic mineral freighter, you have to carry out maintenance work on the superstructure using a network of ladders.

But during your work you make an unwelcome discovery — you are not alone. The ship is being taken over by

aliens who will kill everyone unless someone stops them. And that someone is you.

Your only weapon is your space shovel. And the only way to destroy the aliens is to dig holes in the ship so they fall through, then fill the holes. You just hope the falls are fatal. Just when you think you've wiped them out still more aliens appear. Whatever you do, don't panic.

You start with 2,000 units of oxygen which is supplemented with every alien you destroy.

Scoring varies according to the colour of the aliens and the difficulty in destroying them. Cyan aliens score 100, red 200 and white 300. Red aliens have to fall through two levels and white ones only perish when they have plunged through three levels.

Choice of keyboard or joystick operation. Use a joystick if you have one.

instructions	75%
playability	80%
graphics	70%
value for money	75%



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Shark Attack £9.99

Romik Software, 24 Church Street, Slough Berks SL1 1PT

I made the mistake of thinking this game would be simple to master. I was wrong.

The pirates have thrown you into the shark infested sea and your only protection is a special atomic net with which to ensnare them. And there's the additional danger of octopuses — but sometimes the sharks will deal with them for you.

For every square of the screen you cover with your net — shown in yellow — you gain five points, with 200 if you can completely fill the screen.

Joystick or keyboard operation using A for left, D for right, D1 for up and F1 for down. Using the joystick is best.

instructions	50%
playability	70%
graphics	60%
value for money	70%



Nightcrawler

Rabbit Software, 380 Station Road, Harrow, Middlesex HA1 2DE

A fast-action version of Centipede — and I mean really fast.

You are in the Green Forest where lurk strange and formidable creatures. Your job is to destroy the Nightcrawler by chopping it up into small pieces.

It seems simple until you find there are no less than 39 different levels. So to progress to the level of master — if you ever do — takes a lot of practice with

keyboard or joystick. And while you are trying to kill the Nightcrawler a Pacman-type figure appears on the screen trying to do the same.

For a game where your reactions must be lightning fast, this has few equals.

It's quite easy to score at the lowest level. But to reach the highest level was beyond me, although I tried for hours. Still, it's a challenge worth taking up.

instructions	80%
playability	80%
graphics	80%
value for money	70%



SOFTWARE REVIEWS



VIC Gammon £7

Bug-Byte, 98-100, The Albany Old Hall Street, Liverpool L3 9LP

A computer version of backgam-

mon and very like the real thing. A clear and concise double-sided instruction leaflet is better than the poor guidance provided with some other games.

You play against the computer — you use the black counters and the VIC plays with the white ones — and the player with the highest dice score starts.

The winner is the one who bears off all the counters first. So if you end while the computer has a counter on your side of the board you score three points.

If, as most people do, you play a series, award one point per match. Compulsive to play, VIC Gammon will keep you engrossed for a long time, even if you've never before played the board.

instructions	75%
playability	75%
graphics	80%
value for money	85%



Mastermind £9.99 plus £1.99 per subject

Commodore, 675 Ajax Avenue Slough Trading Estate, Slough, Berks

Based on the TV series, up to four players can take part. You

are asked for their names and occupations and there are two sections, one for general knowledge and one for specialist subjects.

The game runs on a VIC with 8K or 16K memory expansion and specialist subject cassettes cost £1.99.

The package comes complete with two cassettes — the operating system and general knowledge questions — plus excellent instructions showing screen pictures.

Questions on sport and games, wine and food, music, films and television, science and technology are already on the general knowledge tape. Scores are calculated in exactly the same way as the real thing.

An all-round winner.

instructions	90%
playability	80%
graphics	—
value for money	80%



Siege £6.99

Postern, PO Box 2, Andovers Ford, Cheltenham, Gloucs

Your task is to defend your castle against the evil marauders who are climbing the walls. To stop them you must hurl rocks

But naturally they get annoyed at this and start to move even faster.

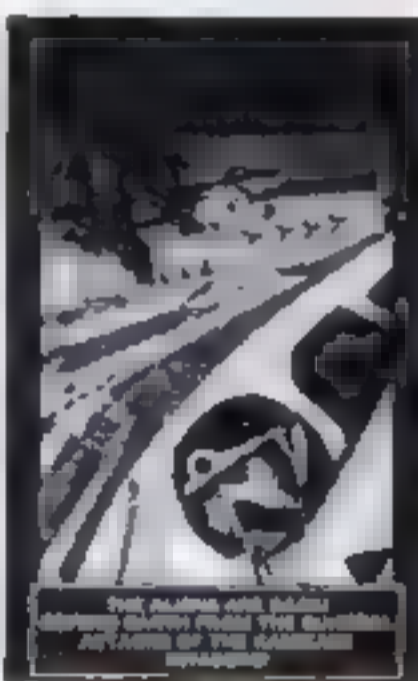
Stop them reaching the top of the wall at all costs or you've lost.

There's a choice of joystick or keyboard operation. But using the keyboard is just too fiddly when you must move fast. I was only happy when using the joystick.

Siege is a good example of not always choosing higher priced and better advertised games. At £6.66 this game is very good value from one of the lesser known software houses.

If Space Invaders becomes a little too predictable, try Siege instead.

instructions	70%
playability	80%
graphics	70%
value for money	80%



Cosmic Adventure £7.99

Audiogenic, PO Box 88, Reading, Berks

Some people never tire of Space Invaders, but it's nice to try a variation. This one has two on

the same tape, for 3K or 8K memory expansion.

The packaging is deceptive, showing a jet fighter attacking an aircraft carrier and a close-up of a World War Two Japanese pilot. It remains another version of Space Invaders.

It seems slow compared with other games of this type. You have to shoot suicidal aliens for one point each and their mother ship, which scores five. You start with one battle station of your own and, unlike other versions, you are awarded another for every 25 points.

Cursor keys are used for left and right movement and the spacebar for firing. A joystick can be used for more flexibility.

For all Space Invaders addicts who are looking for a little extra, without spoiling the fun

instructions	50%
playability	60%
graphics	60%
value for money	50%



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